Postsecondary educational careers and social inequality: an analysis of social origin differences in educational career trajectories and their labor market outcomes in the US, Sweden and Germany

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POSTSECONDARY EDUCATIONAL CAREERS AND SOCIAL INEQUALITY

AN ANALYSIS OF SOCIAL ORIGIN DIFFERENCES IN EDUCATIONAL CAREER TRAJECTORIES AND THEIR LABOR MARKET OUTCOMES IN THE US, SWEDEN AND GERMANY

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Hiermit erkläre ich, dass ich diese Dissertation selbständig verfasst habe. Sämtliche Quellen und Belege sind im Text korrekt angegeben und als solche deutlich gemacht.

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1 CONTEXTS OF EDUCATION THROUGHOUT THE LIFE COURSE – EDUCATIONAL CAREER PATTERNS IN SWEDEN, GERMANY AND THE US.

1.1 Introduction: Life Courses, Education and Life Chances

Compared to former societal and economic orders, in advanced industrial societies life chances are strongly determined by education. Scholars with an interest in social inequality and intergenerational social mobility have recognized this circumstance and the debate about intergenerational inequality has been extended by a large body of research on educational inequality.

At the same time, life course researchers have sought to understand how biographical patterns change in societies with steadily increasing opportunities. There is evidence for an increasing variation in the sequence and order of important life events and life phases of young people in economically highly developed societies (e.g. Shanahan, 2000). Individual consequences of this process can be manifold and depend on which periods of the life course and which areas of the biography are involved. Further, on the societal level consequences for social inequality can be expected, in particular if life courses diversify during formative periods with a key role for status attainment. Youth and young adulthood are important periods for the placement in the social order. Not last due to the fact that education still falls into these earlier parts of the life course. At the same time as individual life courses aggregate to outcomes on the societal level, society and its institutions shape individual life courses (Buchmann, 1989; Mayer and Müller, 1986). Social institutions, structural conditions and incentives as well as social conventions and norms determine how individuals will eventually live their life.

Within this interplay of individual life courses and societal institutions, the transition from the education system to the labor market is a central step for the

biography of young people. Several studies show a de-standardization this area life too. The pattern of initial education and then a single entry event into the labor market does not characterize anymore the school-to-work transition of many young people (Brückner and Mayer, 2005; Buchmann, 1989). Other authors show that it depends on the country context in how far educational careers are intertwined with the labor market entry (Jacob and Weiss, 2010a). Furthermore, there the standardization of educational career patterns and their mixing with other activities is coupled in several context with ascriptive variables, such as social origin (Jacob and Weiss, 2010b for Germany) or race (Coleman, 1984 for the US). Much more frequently, the school to work transition is studied as a single event, or with a focus on the labor market career. Here, international comparisons weigh out by far the comparisons over time and reveal strong differences of in the standardization of life courses and the smoothness of a transition (Gangl, 2002; Kalter and Kogan, 2002; Kerckhoff, 2000; Kim and Kim, 2003; Kogan and Müller, 2003; Kogan, Noelke and Gebel, 2011; Kogan and Unt, 2008; Kurz et al., 2008; Leuze, 2010; Müller and Gangl, 2003a; Ryan, 2001; Saar, Unt and Kogan, 2008; Scherer, 2005; Shavit and Müller, 1998; Wolbers, 2007). These studies identify typical features of the transition process in the different societies and connected them with the structural conditions of the labor market and the education system. Empirically, this literature focuses on the integration into the labor market. Studies incorporating other life domains – e.g. family formation during the early career or further schooling – are less frequent (cf. Scherer, 2001 for an excpetion).

In parallel to the de-standardization of life courses, the tertiary education system expanded throughout the last four decades in all industrial societies. Higher education systems are confronted with a strongly increasing number of students (Arum, Gamoran and Shavit, 2007). This has consequences for life course research as well as for research on inequality: Firstly, the postsecondary education system, and in particular tertiary education, has gained power for structuring life courses and working careers. And secondly, this goes along with an increasing role of higher education institutions for the assignment of social positions. As a consequence, the attention of the scientific debate on intergenerational inequality shifted partly into the postsecondary part of education, what is mirrored in a large number of studies showing social origin differences in higher education attainment (Astin and Oseguera, 2004; Davies and Guppy, 1997; Mayer, Müller and Pollak, 2007; Müller and Pollak,

2007; Reimer and Pollak, 2005; Schindler and Lörz, 2011; Schindler and Reimer, 2011; Shavit et al., 2007). The increasing number of highly educated individuals goes along with the expectation of a devaluation of higher education for the labor market status. Even though these expectations have not been confirmed by recent research, e.g. for Germany (Klein, 2011), the contribution of the higher education system to the continuously high intergenerational stability of social position has increased. Thus, studying characteristics of the higher education system and its interplay with other institutions such as the secondary education system and the labor market has gained a larger role in research on inequality.

One transition, which is a crucial aspect of de-standardized educational careers, is the return from the labor market back to school. Research on inequality often still assumes that education follows a straight route and studies this process mostly independent from the developments in other life domains. Human capital models of educational participation, for example, do not consider this possibility. From their viewpoint a re-enrollment would only occur if capital markets for credit constraints fail or human capital depreciates fast (Marcus, 1986). Empirically, an increasing number of country studies testify that the single transition-model is often not correct. Several authors find for the US context that interruptions within the educational career and delayed entry (or re-entry) are frequent (Adelman, 2006; Arum and Hout, 1998; Carneiro and Heckman, 2003; Light, 1996; Light, 1998; Maralani, 2011; Marcus, 1986; Oettinger, 1993; Roksa et al., 2007; Taniguchi and Kaufman, 2007). Studying the de-standardization of the life course, Buchmann finds for the US already in the 1980´s an increase in the share of interrupted educational careers (Buchmann, 1989). Arum and Hout (1998) link the issue of educational career patterns to specific educational institutions and connect the diversification of education with the diversification of individual life courses. Empirically, social origin effects have been observed also for late education within other education systems such as the US (e.g. Goldrick-Rab, 2006; Goldrick-Rab and Han, 2011; Roksa, 2011). Outside this heavily US-centered body of research on college transitions, less is known about the link between such non-traditional education patterns and social origin, in particular not with regard to systematic country differences. Past studies on the German context observed that different specific types of deviations from the norm-educational career are more common among lower social origin students on specific sections of the educational career (on the participation in the so-called '2.

Bildungsweg' e.g. Henz, 1997; for multiple postsecondary degrees e.g. Jacob, 2004; for the secondary school system in comparison to the Netherlands Jacob and Tieben, 2009), but also in a more comprehensive view (Hillmert and Jacob, 2010; Jacob and Weiss, 2010b).

This volume aims at integrating research on educational inequality by social origin further with the life course perspective. I will go beyond previous studies in several aspects by studying patterns of and transitions within postsecondary educational careers. Two central research questions are being discussed:

First, I will study social inequality in educational career patterns. The target sample consists of all those young adults who qualify for higher education. Specific attention will be given to the decision to re-enroll in the education system, which is a core component of many non-standard educational careers. In order to evaluate the role of structural conditions, I compare three country cases: Germany, the US and Sweden.

Second, I will investigate the effects of non-traditional educational career patterns on a successful labor market entry. This second step makes a relevant addition to the first step for evaluating the contribution of educational careers to intergenerational persistence of social status.

The comparative study follows a tradition of life course research with a focus on structural conditions, set by the state, as framework for individual life courses (Mayer and Müller, 1986). Recent reforms in the European higher education sector strengthen the relevance of a comparative study, in particular with regard to the developments in Germany. The call for more upward permeability of the higher education system for disadvantaged groups has been one motivation for the so-called Bologna reforms. Not only is the tradition of long study programs given up and the educational career is broken down into several steps by the Bachelor-Master system. A central part of this reform also aimed at widening access for non-traditional students and at creating opportunities for more individualistic educational careers (Bundesministerium für Bildung und Forschung, 2012, p. 31; Education Audiovisual and Culture Executive

Agency Eurydice, 2012)[1]. In sum, these changes bring the German postsecondary education sector much closer to the model of the Anglo-Saxon and the Nordic countries, which is a major motivation for my selection of comparison cases.

Throughout the volume, several seemingly vague or unusual terms have to be used; in many cases for consistency with the literature. Some will be clarified within the next chapters and in section 1 within the short discussion of my methodological approach. Some other clarifications should be made beforehand. Firstly, a large body of research investigates the role of education in the life course, but mostly with regard to training or less formal education. The role of these forms of skill formation have gained much attention within the sociological and economic literature both with regard to inequalities in access and the effects on later career mobility. For this volume, when I refer to education, I mean 'schooling' throughout. Instead of training courses for specific job tasks, I am interested in attainment of education outside companies, or as the NLSY79-questionnaire asked about in my American sample: 'being enrolled in regular school'.

Secondly, the type of education I am studying is postsecondary education, which is in some few cases limited to higher education. Postsecondary education comprises both higher education and other forms of education beyond secondary school. For the US, the differentiation is less important because most scholars simply refer to 'college'. In European contexts a number of educational alternatives exist for those who are qualified to enter higher education, e.g. vocational (apprenticeship) training in Germany. I will subsume all of them under the label of 'postsecondary education'. My sample is limited to those young adults who are entitled to enter higher education. Thus, postsecondary schooling collects all types of regular schools these individuals could visit.

Thirdly, as soon as life courses are involved, the terms *standardization*, *patterns*, *sequencing* or *individualization* are frequently used within the literature (Brückner and Mayer, 2005). The central concern with regard to educational careers throughout this volume is de-institutionalization and de-standardization at the same

[1] See for example the newsletter of the project on quality management of the university president conference (Projekt Qualitätsmanagement der Hochschulrektorenkonferenz) in January 2009, p. 12, with the article 'Stifterverband fordert Öffnung der Hochschulen für Berufstätige'.

time. To recapitulate this, the following definitions given by Brückner and Mayer (Brückner and Mayer, 2005, p. 32) are helpful:

> 'The *institutionalization* of life courses refers to the process by which normative, legal or organizational rules define the social and temporal organization of human lifes. It can refer to stages or states in lives which can be formally decreed like marriage, education and retirement. It can also refer to transitions like leaving school, entry into and exits from labor contracts, or ages of pension entitlements.' … 'Conversely, *de-institutionalization* would then mean that states, stages, events, and transitions, which at earlier times were clearly differentiated, are being re-integrated or fused'.
>
> 'The *standardization* of life courses refers to processes by which specific states or events and the sequences in which they occur become more universal for given populations or that their timing becomes more uniform.' … 'Conversely, de-standadization would mean that life states, events and their sequences can become experiences which either characterize an increasingly smaller part of a population or occur at more dispersed ages and with more dispersed durations.'
>
> '*Differentiation* refers to the process of where the number of distinct states or stages across the life time increases'.
>
> '… the term *individualization* (Beck, 1986; Junge, 2002; Schimank, 2002; Wohlrab-Sahr, 1992) is frequently invoked to refer to many of the changes mentioned above. It is a more interpretative concept according to change which individuals are assumed to gain greater control over their lives, thus pursuing a wider variety of life designs and life trajectories.'

Comparing these definitions with the motivation for my study as outlined above helps to substantiate the research question on the institutional level. The process I am expecting for the German context, which already advanced much further in Sweden and the US, is *de-institutionalization. Flexibility for non-traditional careers* or *openness* are terms I am often using when referring to the degree of institutionalization of education systems. The consequence I am expecting on the individual level is *de-standardization*. In cases I use terms such as 'diversity in patterns' or 'individualization', these refer to the degree of standardization of life courses throughout a population. However, I am not only concerned with the overall stage of de-standardization of societies, but also with individual *deviations from*

national standards. Deviating cases from the nationally institutionalized framework with regard to education will often be termed *non-traditional students*.

The main two dimensions of institutionalization of education system I will compare are *openness* of the higher education system and *flexibility*. Openness (as opposite to restrictive or selective) broadly refers to the question how selectively and irreversibly the education system defines access to higher education. Open systems would be characterized by a few barriers regarding nominal eligibility to higher education, which are permeable compared to other systems. *Flexibility* means the institutional set or rules defining whether students individually decide about their curricula, class schedules and educational career trajectories. To exemplify, policies which facilitate credit transfer between colleges, allow part-time studies, stop-outs for a longer time or distance studies would increase flexibility. Generally, in contrast to openness, flexibility can apply even if a system is selective. Flexibility does increase openness by removing barriers for re-entrants, but openness is a much broader concept capturing more than the mere institutional design of the higher education system. In principle, they are two different theoretical dimensions. Empirically however, they are often coupled. Whether the two characteristics are systematically linked our not would be another question for institutionalist researchers, but empirically they often are. A systematic link between them seems highly plausible. Therefore, I may sometimes lump the two dimensions together as systems, even though I am aware that the concrete institutions accounting for each of them are different ones. To distinguish is, however, important when thinking about policy implications. The counterfactual for increasing openness includes removing selectivity from the secondary education system and in consequence shifting decisions about educational decisions into later ages. Increasing flexibility on the other hand would only mean to make the higher education system more open for students with other obligations, but who already qualified for higher education. Selectivity of the secondary education system can remain as it is.

This exercise in nominal definitions refers in particular to section 2 and chapter 3.4, where measures are defined more technically. But also all other sections are affected. The definitions I have given here limit the framework out of which the phenomena I investigate throughout the book, which all can be subsumed under these terms.

The book is partitioned into six sections. The remainder of this section introduces into the fundamentals of my international comparison: the reasoning for a small N comparative case study, the case selection and the institutional setup of the comparison countries as well as some first descriptive facts on them. Within this section, I will also shortly familiarize with the datasets I am analyzing and how I define and measure social origin. Section 2 describes the typical structures of educational careers in the three country contexts and compares their degree of de-standardization. Following that, section 3 contains four chapters on inequality throughout postsecondary educational careers. Then, the last two sections engage into a micro-centered approach. The question why these micro studies follow a country comparison and not vice versa might appear somewhat unusual. Choosing this structure has its major reason in the small number of comparative studies on the main research questions. In order to be able to improve structural explanations, the relevant micro-processes that can inform macro-level comparisons had to be picked yet. Completing a first macro comparison results into questions about micro-level processes. Then, studying these questions more carefully can inform future institutional research. Beyond understanding social inequality in later educational transitions, the aim of the individual centered chapters is to eventually contribute to more informed studies on the institutional level in the future. In chapter 4.3 I take a first start by comparing Sweden and the US with regard to a more specific research question on costs and parental class positions as deterrents for re-enrollment into postsecondary education. Finally, in section 5 I ask about the consequences of de-standardized educational careers for the labor market entry after completing education, my second research question. Section 6 closes with a short conclusion and discusses policy implications.

In the remaining part of section 1, I will introduce into the backgrounds of this comparison, including the case selection and a description of the country contexts. Further, I will present the datasets used throughout the empirical chapters.

1.2 Institutional Structures and Individual Life Courses: Approaches to Research on the Individual and the Societal Level and their Linkage

The question how states and institutions shape living conditions and social realities is central to sociological research. States intervene into and structure life courses to a large degree, even though these macro structures can be easily overlooked since they are constant over comparatively large groups of people and historic periods. However, theorizing on institutional conditions followed very different approaches being rooted in very different traditions. Therefore, I will discuss some methodological of my research first before I come to more specific aspects of the research question and my strategies for answering it.

This volume addresses different questions on two different types of 'units of analysis'. Individuals and their life courses on the one hand, institutional settings on the level of societies on the other hand. On the individual level, data from large-scale survey studies are the basic source of information for my research. I use quantitative statistical analyses to draw conclusions about individuals in each of the countries. The methodology on the societal level on the other hand is a comparative qualitative case study of three societies. Since the debate about methodological approaches of comparative research in the social sciences is a controversial one, I will briefly discuss the standpoints in the literature and further spend some space to justify my choice of a qualitative design.

1.2.1 Societal and Institutional Structures as Conditions for Life Courses: Regimes, Variables and Cases

The aim of comparative research in the social sciences is to use real world institutional differences between countries for learning about the impact of institutions on various outcomes. So far, this seems to be the shared basic consensus of all participants in the debate about how comparative research should be done 'appropriately'. Beyond that, however, the dispute on the question how to handle the complex situation of few and very complex units of analyses is discussed controversially. These complex units – of which only few exist – are contingent in their historical development and by far not independent from each other (cf.

Ebbinghaus, 2005). This seems a difficult starting point for 'business as usual' of quantitative sociologists – or maybe even for any research? What outweighs these worries in my opinion is that learning about institutional conditions and their influences on individuals has strong potential on contributing to sociological explanations of inequalities. And furthermore, if it succeeds it has the potential to develop information which can inform political debates. While e.g. explanations referring to human biology or natural contexts often are important – but their causes are unavoidable – the design of institutional structures in most cases dates back to political decisions. Reforms, e.g. of the healthcare insurance, pension system, labor market regulations or the education system are policy decisions. The impact of ash of volcanoes on air traffic or of sun on Texas and Australia might have as far reaching implications for life courses, but cannot be changed by policy makers or any other human beings. By contrast, the subjects of comparative research in the social sciences are subject to action, and not only reaction, of policy makers.

1.2.1.1 Comparative Research Beyond Description

Out of the tradition of historical comparative research – which has emphasized the uniqueness of cases – the strand of comparative research in sociology has compared country cases in detail. As Scheuch (1990) has put it, in studies emphasizing the historic context and unrevealing systematic institutional links, context is 'treated as a real thing' (Scheuch, 1990, p. 31). However, the motivation of comparative studies in the social sciences was not to describe the uniqueness of cases per se, but rather to use the generalizable characteristics of them for building and improving social science theories. Przeworski and Teune suggest to consequently following research strategies that are suitable to serve this aim:

> '…explanation in comparative research is possible if and only if particular social systems observed in time and space are not viewed as finite conjunctions of constituent elements, but rather as residua of theoretical variables. General lawlike sentences can be utilized for explanatory purposes. Only if the classes of social events are viewed as generalizable beyond the limits of any particular historical social system can general lawlike sentences be used for explanation. Therefore the role of comparative research in the process of theory-building and theory-testing consists of replacing proper names of social systems by the relevant variables' (Przeworski and Teune, 1970, p. 30).

When following this suggestion in a consequent way, comparative research will find itself in a contradictory situation. On one side, there is the aim of reducing and generalizing information to create systematic and abstract theoretical knowledge. On the other side, empirical research can only base its inference on few repetitions of differences and regularities between a small set of cases only. The fierce debate accompanying all efforts to realize empirical comparative research thus comes at little surprise. The core of the debate in different social sciences refers to the 'small N problem' – i.e. the small number of cases that differs on a large number of variables. As for any non-experimental observational study, causal interpretations of the results are subject to a number of fallacies. I will not discuss these problems here again in length, as there is a large number of contributions doing this already (King, Keohane and Verba, 1994; Lieberson, 1985; Lieberson, 1994).

1.2.1.2 The Number of Cases: Why not as Many as Possible?

Two methodological approaches are proposed to tackle this problem. One camp of scholars proposes macro-quantitative studies as the solution. They use statistical techniques and compare as a many countries as possible to handle the problem of too many confounding variables by statistical control. In Scheuch's terms, their approach is to treat 'context as a set of variables' (Scheuch, 1990, p. 31). Such studies became a very popular variant of comparative research. With the availability of more and more – mainly European – comparative data sets, this approach has experienced a boom. In contrast, proponents of the case approach criticize the use of statistical simplifications and the treatment of large numbers of countries as samples for several reasons. Many scholars have attempted to structure the discussion and describe the problems arising from the frequent use of this approach, often in their own terminology. For this chapter, I will review only a small part of this literature, which refers to the problem of missing information in the reduction by statistical models. Within the context of institutionalist life course analysis, Mayer (2009) divided the different research traditions into the 'variable approach' and the small N 'case approach'. Macro-quantitative studies of the variable approach-type build statistical models for isolating single variables. This raises at first the question, whether a sometimes more or less thoughtful statistical control of other variables would do this job properly. If enough proper measures for all relevant variables are available for enough country cases, this

strategy might work – in theory. In practice, it is likely that quite a number of macro-quantitative studies would benefit from a deeper knowledge of the single country cases to improve model building.

Comparative case studies can thus be justified as a helpful source of information for later statistical model building. But should the purpose of qualitative comparative case studies be reduced to an inductive, premature form of the 'true science of macro-quantitative comparison'? As Kittel has noted in his discussion of fallacies of the macro-quantitative approach, careful and deep comparison has been a major method of many classical sociologists (Kittel, 2006). The reason could lie in the circumstance that entire social processes or 'systems' and their path dependent development (Ebbinghaus, 2005) can hardly be pinned down to a single variable and are easily overlooked when reducing country characteristics to variables (Brady, Collier and Seawright, 2004; Stinchcombe, 1968). A good example is the theoretical distinction between the logics of internal and occupational labor markets and their interplay with the educational system. This established explanation for many phenomena of youth labor markets in different societies was developed in several small N studies (Kerckhoff, 1995; Marsden, 1999; Maurice, Sellier and Silvestre, 1986; Müller and Shavit, 1998a). Similarly, comparative studies (e.g. Gangl, 2004) could contribute much to an understanding of how institutional arrangements within countries influence individual life course patterns. The fruitful impact of these examples on sociological knowledge shows that it can be worthwhile to engage in such effort and discuss each country in more detail than simply modeling their characteristics in regression models. The explanations developed in a cumulative debate of such studies are well established, even though could never be tested applying more rigorous, quantitative methods. Moreover, path dependencies (Ebbinghaus, 2005) might be overlooked, which may or may not be seen as additional problem. The problem of path dependency is in principle solvable in quantitative studies, if unite roots are modeled e.g. using fixed effects models (given the researcher knows about the problem, of course). Therefore, I see the major divide in the question how detailed information on single cases is needed, against the need for as many cases as possible to establish causal relationships.

Beyond historical contingency and the difficulty of capturing systematic complex interrelations of institutions, other problems have been brought up against macro-quantitative studies. One is the impossibility of random sampling. Deliberative

sampling of countries based on theoretical hypotheses seems unavoidable, given the small number of industrial nations that exists.

What is to be admitted by proponents of the qualitative approach is the awareness of great difficulties to prove causal relationships in one single empirical study. Evaluating theoretical arguments against such kind of empirical evidence can only be done with much caution and should be embedded into a longer process of scientific discussion. Bueno de Mesquita describes this process of cumulative establishment of explanations and evaluating theories using comparative case studies as 'the first principle of wing walking' (Bueno de Mesquita, 2003). He suggests exposing theories to a 'storm' of strong scientific knowledge that could best serve as falsification of them following the basic suggestions of Popper (1963). The researcher who proposes theories on the other hand 'should not abandon one theory for another until the new theory proves to be the better tool for explaining the events of interest' (Bueno de Mesquita, 2003, p. 81). Sticking to these principles in a scientific debate leads to the continuous improvement of knowledge based on falsifications. But only careful checks, replications and the cumulative outcome of many empirical studies will slowly build up good explanations. A crucial step for finding empirical evidence with the potential of falsifying theories is the selection of strong cases, which also vary in theoretical relevant aspects. I therefore discuss the selection of the three country cases analyzed below under 1.3.

This principle, however, implies that more cases with testable implication for a theory are always better than less and is thus in principle also in line with the variable approach. Detailed information on single cases might be needed too – but the more cases, the better. The fasten up the cumulative collection of more cases can indeed not be criticized on the basis of all those argument in favor of small N studies, if the complexity of single cases can be captured good enough. In the field of social stratification, cooperative comparative case studies have been used to compromise between detailed information of small N on the one side and the strength of large N designs in ruling out spuriousness on the other side (Arum, Gamoran and Shavit, 2007). Each country is described in its own article or book chapter written by a country expert. The single chapters are written in a way that offers a good basis for the comparison. The comparison itself then summarizes the findings of the country chapter. These studies are able to present all cases in a sufficiently detailed way and at the same time use the practically maximal possible number of cases. In many nearby

areas of research similar to my research question, studies have yielded great insights on macro-level differences. For example on the transition from education to work (Müller and Gangl, 2003b; Shavit and Müller, 1998), inequality in educational achievement (Shavit and Blossfeld, 1993) or inequality in the access to higher education (Shavit et al., 2007). Even though combining the strength of both approaches is an appealing strategy, I cannot follow this model for the comparative research within this volume. First and most trivial, dissertations cannot be authored by a large number of country experts whose findings are then summarized by the candidate. Second, I presume that the theoretical complexity of the research question on the micro-level also requires a more intense discussion about the micro-level mechanisms than one chapter per country. As the number of comparative studies on late educational participation is still very small, sound theoretical explanations have yet to be developed. Furthermore, two institutional areas and their interplay are relevant: the labor market as well as the educational system. Against this background, a detailed investigation of each of the country cases seems necessary instead of a strong simplification to single variables that are necessary for macro-quantitative comparisons. Third, any approach addressing the question of inequality throughout educational careers in adulthood that requires a larger quantity of countries or even repeated measurements over time for these countries could fail due to data unavailability. The fact that longitudinal data with detailed life histories is required limits the choice of country cases considerably. I will therefore focus on a comparison of three country cases with a long tradition of small-N comparisons, but less with regard to non-traditional educational careers, Germany, Sweden and the US. Although I cannot reject that more countries would be better – compromising on the depth of the country studies seems to be the more problematic alternative.

1.2.1.3 Abstract Regimes or Concrete Institutions?

Another methodological and theoretical problem is the question on how explicit single institutional differences should be addressed or how much entire systems can be treated as ‘regime types’. The latter may be a way of overcoming the problem of independent variables. Many examples of sociological work can be found that theoretically justifies the ‘lumping’ of states to regime types. Originally, these types fulfill exactly the purpose of describing entire systems of institutional regulations. The

clusters are justified by theoretical arguments how different institutional settings interact and develop in path dependencies arriving at stable higher-level system. The resulting regime typologies ought to be informative on many areas of social life and living conditions. At present, most prominent are probably Esping-Andersen´s 'Worlds of Welfare States' (Esping-Andersen, 1990) and the 'Varieties of Capitalism'-typology (Estevez-Abe, Iversen and Soskice, 2001 with particular reference to education; Hall and Soskice, 2001). The aim of these studies is to find a 'higher dimension' or regime behind institutional settings, shaping the conditions under which individuals live. The appealing feature of these approaches is that it enables to simplify and create labels for the complex institutional systems for comparative research.

The high complexity of institutional settings is a strong challenge to comparative research and theoretically informed simplifications are therefore a welcome escape from the multitude of legal regulations, institutional settings and historical contexts for many researchers. Thus, the resulting regime types may inspire later studies on very different issues to ignore the full institutional setting and compare countries on the basis of regime types only. If intended or not, the 'regime-typologists' have prepared the grounds for macro-quantitative comparisons by providing a variable that promises to capture the mechanisms and processes in a society under a simple label. Therefore, I argue that making the adaption of existing country clusters the theoretical backbone of new studies goes along with the danger of deviating from the origins of theorizing in concrete and real institutions. In the most simplified form the clusters are often nothing more but variables which are hard to capture in their intensity, in the timing of their development and in the way they can influence individual behavior. The practice of simplifying packages of institutions to regime types has provoked other critiques (Mayer, 2005). A broad categorization and labeling of regime types may lead to a problematic loss of information for the researcher and thus bare the potential of losing explanatory grid. At least three arguments guided me in not following this research tradition, and even ignoring their work to some degree.

First, the labels of welfare state regimes or another grouping of countries may be too broad and general for distinguishing all relevant aspects and specific domains of the life course. States differ in many relevant institutional aspects, even when grouped into the same welfare state category (Mayer, 2005, p. 35f.). For individual

behavior, details can often be very powerful. For educational systems, this statement is at least as true as for other domains of the life course. To exemplify, Denmark shares many feature of the vocational training system with Germany, while Sweden emphasizes on general education and flexibility in the educational career throughout adulthood, and thus resembles many features that are known to be characteristic for the US system. In terms of Esping-Andersen's worlds of welfare states, Sweden and Denmark would be analyzed as equivalent examples for the Nordic social democratic welfare system (Esping-Andersen, 1990).

Second, partly as a result of the heterogeneity within the country clusters, Mayer argues that the comparison of individual states offers more opportunities for tracing specific life course domains to their adjacent policy domain (cf. Mayer, 2005). Explanations for educational career differences would first to be looked for in the set-up of the educational system, and not the healthcare system. Such a focused view, he argues, enables to build macro-theoretical hypotheses that are informed by the micro level. Individual behavior can be directly tied to relevant policies. The advantage is that the choice of a reasonable sub-set of policy fields shrinks the gap that theories have to fill between exogenous institutions and individual life course outcomes. Thus, concrete institutions suit better for developing arguments based on methodological individualism[2]. More precise theoretical statements can be developed than under the broad framework of welfare state clusters. To some degree, the breakdown to specific institutional sub-systems seems as one would give up the idea of analyzing entire country-systems and move – at least somewhat – towards the variable approach. But this is not necessarily the case. Although the reduction to specific areas of institutional set-ups might ignore some contextual information, it still allows for more than the analysis of 'variables' without regarding any (historic national) context.

Finally, a third advantage of more concrete hypotheses is their value for policy analyses and policy evaluation. As difficult as it is to establish causal relationships by doing comparative research, if this succeeds the causal link should be understood as good as possible. And it should be as useful as possible for evaluating future policies. This does not mean that direct policy evaluation should be the main aim of comparative research. But policy informative theory building can nevertheless be seen

[2] For the discussion on the benefits of building theory simultaneously on the micro and the macro-level see the contributions of Coleman (1990); or Esser (1999, , Ch.28). For a discussion of the purpose and limits of restricting theory-building to methodological individualism see Stinchcombe (1968).

as something useful, and nothing would be less explicit than knowing that a certain circumstance is as it is just because the country in which it occurs belongs to a cluster. Specific institutional areas, such as the educational system, the labor market or the system of unemployment protection and benefits, are not only more likely to explain properly, the practical value of theories on these systems is also greater.

Following the arguments documented above, a small N comparative case study without the aim of creating 'big' regimes is the model I will follow. Having made this choice, I can now go on discussing the selection of cases. For such a small-N study, deliberative case selection – instead of random sampling – is a central and crucial step (e.g. Bueno de Mesquita, 2003; Ebbinghaus, 2005). Previous research and theory should inform the selection of cases as much as possible – but also practical and methodological issues have to be regarded. The following section discusses the case selection. I will underpin case selection with theoretical arguments in places, but won't develop my hypotheses for the comparative study in their full scope. This will be left for later chapters.

1.3 Case Selection: Educational Systems and Labor Markets – the Potential of a West-German, Swedish and US-American Comparison

In the following I will briefly discuss the selection of the three country cases. An extensive discussion of case selection would normally require first a presentation of all theoretical hypotheses in detail. Up to this chapter, this has only been done in a rather crude way. The reason is that the broad research question on inequality in discontinuous educational careers is broken down to more concrete sub-questions that I discuss in their own chapters. Thus, it seems to make the single chapters easier to read if the theoretical hypotheses are derived in each chapter. For elucidating the case selection, I will therefore refer to rather global aspects of the education system and the labor market, affecting all different steps of educational careers.

Most central institutions are the secondary and the postsecondary education systems. The secondary education system regulates access to higher education. The postsecondary education system is the actual institutional environment of individual educational choices. Furthermore, educational policies by the state accompanying the education system set-up itself - such as student aid or specific rules introduced by the government for non-traditional students - are to be considered. Beyond that, my macro-level arguments are also based on differences in the labor market. In short, this seems important as the labor market is the major alternative to schooling for young adults. It may well matter for educational decisions 'what could be gained on the labor market by attending education' (Becker, 1964). For non-traditional, later students the labor market also defines what is lost by giving up work and re-enroll. Therefore, labor markets and the higher education system were the focal institutions when selecting the comparison cases, apart from practical considerations such as the availability of previous national research and the accessibility of longitudinal datasets.

1.3.1 Germany´s Recent Development in the Education System and Future Policies as a Starting Point

One of the motivations to engage in a country comparison is the recent development in the German education system implying a gradual assimilation to the Anglo-American and Scandinavian education systems. I will thus start discussing the selection of country cases from these developments in Germany. I will limit the comparison to West Germany, since East German education and labor market careers were still strongly affected by the historically unique situation of the post-socialist transformation. Traditionally, the German educational system is a rather strictly institutionalized and inflexible one, even for postsecondary education. Access was very restricted by prior educational achievement, options for non-traditional students were scarce (Schuetze and Slowey, 2002; Teichler and Wolter, 2004). In the last years, reforms stimulated by the European Union and the German government, have changed the system with the aim of becoming more flexible and open for non-traditional students. Until the Bologna reforms, Germany's higher education system was a parallel-stratified system with two major tiers (cf. chapter 1.4). In the early 2000´s, this has started to change and new, sequential elements of stratification were introduced. Yet, a before-after comparison of entire educational careers of German students is impossible due to the slow implementation of the reforms and the long life-course period to be observed. International comparisons of the earlier years of reorganization to other education systems are more feasible.

Two countries that have de-institutionalized their higher education sector and introduced such flexible arrangements in higher education much earlier are Sweden and the United States. First, the sequentially stratified education system – that Germany has implemented later – has existed there for a long time already. And second, restrictions in access to higher education are rather loose. With regard to policies fostering educational career flexibility, both countries are far ahead in the direction that Germany seems to go. In the 1970's Sweden made reforms similar to the ones as Germany is undergoing now, but in an even more rigorous way (see chapter 1.4 for description of all three higher education systems). As will be shown in later chapters, there is now a high amount of adult learners in the tertiary sector. By international comparison, Sweden fares on the top of the distribution of the different indicators of adults participation in formal schooling (e.g. Róbert, 2012). Sweden thus

qualifies as a comparison case for the old German system, as it offers a prospective view on the effects of the reforms that Germany has just started. It fundamentally differs though in central aspects, e.g. the generous Swedish student support.

The United States have an even longer tradition for flexible arrangements in higher education. Driven by the growth of the community colleges, tertiary education targets a much broader group of students, including a large number of mature students (cf. chapter 1.4 of this volume). The recognition of previous courses in other colleges is as common as part time studies. Thus stop-outs, switching between colleges and combining college with work are easy to realize.

With regard to the secondary education system, both comparison cases have in common that lower educational institutions are, compared to Germany, much less rigid and consequent filters for eligibility to higher education. access to higher education is comparatively open. The gatekeeping-function of schools is not very rigid compared to Germany. Germany´s recent reforms for higher education studies without general education certificate (e.g. Buhr et al., 2008; Hanft and Brinkmann, 2013) as well as the large increase of students who are admitted via vocational tracks in secondary school (Schindler, 2012) show that countries also assimilate in this respect.

All in all, the American as well as the Swedish systems is very flexible compared to the German case. Therefore, they qualify for a comparison with Germany in order to inform expectations about possible consequences of the present German reforms. Justification of the choice of these comparison cases is further strengthened by the fact that, apart from educational flexibility, other relevant institutions such as student support or labor market regulation differ between these two countries.

The triple Germany, the US and Sweden is a frequently studied set of cases within comparative research. Previous research has mainly highlighted system differences and rarely pointed out similarities between any of the three. Many studies have used the three cases as ideal types for institutional settings. Quite a number of these studies have found that each of the three cases frames life courses in its own way throughout different sub-systems of the welfare state. Mayer (2005) as well as DiPrete (2002) summarize comparisons on the national institutional configurations and their effects on life courses and inequality. Table 1.3.1 is an excerpt of Mayer´s table 2.5 (Mayer, 2005, pp. 34-35) including those institutions that are of particular

importance for educational career patterns. The single institutions and their effects both on the trajectories of postsecondary education as well as on inequality in education need to be discussed in more detail in the theoretical sections of the respective chapters. It is evident from table 1.3.1, that the similarity of Sweden and the United States in the flexibility of postsecondary education is by no means transferable to other policy fields[3].

Table 1.3.1: Comparing institutional settings and life-course outcomes (Mayer, 2005)

life course institutions	United States	Germany	Sweden
schooling	low stratification, low standardization, general education	highly stratified, high standardization	low stratification, high standardization
vocational training	marginalized vocational school, on-the-job training	apprentice/vocational school, dual system, highly standardized, employer/ union coordinated	vocational school (upper secondary), unstandardized, uncoordinated
school-to-work linkages	loose linkages, personal networks	tight linkages, apprenticeships, employment offices	loose linkages, labor exchange
firm-based institutions	weak internal labor markets, high occupational welfare	strong internal labor markets, medium occupational welfare	weak internal labor markets, low occupational welfare
active labor market policy	low	(medium) training/ employment subsidies	high vocational (re)training; low skill public employment
labor market regulation	deregulated, weak job protection	highly regulated, work conditions and benefits, strong job protection	medium regulation, work conditions and benefits, weak job protection
family policies: family allowance, childcare, parental leave	income replacement	direct cash transfer-entitled income replacement; long job protection	direct cash transfer to child; strong public provision of childcare; long/generous income replacement and job protection

Source: Mayer, 2005; pp.34-35.

1.3.2 Labor Market Regulation

Table 1.3.1 already identifies differences in labor market policies and identifies differences between Sweden and the US, but also between Sweden and Germany. I argue, however, that the Swedish system was closer to the German one in the 1990´s

[3] Regarding school-to-work linkages it should be noted that the table refers to lower qualifications. For higher education, the linkages are certainly weaker in Germany and more alike those in other contexts (cf. Kim and Kim, 2003 for a comparison of the German system to the UK). So far, not much research has dealt with the question in how far the German higher education system has similar particularities by international comparison as the secondary vocational education system.

when most of the educational career I will study took place. Therefore, table 1.3.2 compares labor market policies again referring to the relevant historical period. Two summary-measures capture several characteristics of the labor market affecting individual life courses. The employment protection legislation defines how stable jobs can be expected to be once they are entered. The flexible US system is mirrored in educational careers with more frequent interruptions, more frequent transitions between occupations, but also less severe average scaring effects for temporal labor market dropouts and a generally easier access to jobs for labor market outsiders (DiPrete and McManus, 1996; Gangl, 2004; Kappelhoff and Teckenberg, 1987; Lindbeck and Snower, 1989). These features of the US labor market might be important for young adults who re-enroll into postsecondary education, since they define what is given up by leaving the labor market for re-enrollment. In the flexible employment regimes, the opportunity costs for giving up a job position can be expected to be lower. The unemployment protection on the other hand consists of measures to ameliorate hardships when unemployment occurs. This again can affect individuals in several ways when deciding about belated enrollment. If unemployment protection e.g. is high, it might be easier to risk re-enrollment since the time for job search after leaving the school will be funded. Generally, both unemployment protection and employment protection legislation describe the 'strictness' of governmental intervention into the labor market. The higher the value, the more regulated the market.

Table 1.3.2 shows the results from comparative research characterizing the 'employment protection legislation' as well as the 'unemployment protection'. To put the numbers into context, other countries are included as well. All values refer to the relevant period, the 1990´s. In this period, the strictness of employment protection legislation (EPL) as well as unemployment protection is rather similar in Germany and Sweden, while the US has a very low score (OECD, 2004a). With regard to labor market intervention, Sweden and Germany are on a very similar level, while the US stands out with the most market-liberal system. This illustrates the welcomed difference between the US and Sweden. Thus, the comparison between the inflexible German education system and flexible other education systems can be done towards two different labor market contexts. Even though the German and the Swedish systems are not identical in the entire structure of the labor market – in particular for entrants (Erikson and Jonsson, 1998a; Müller, Steinmann and Ell, 1998) –the

differences in the labor market of the two cases being compared to Germany strengthen the comparison of the education systems.

Table 1.3.2: Labor market protection legislation and unemployment protection legislation in selected countries.

	(West-) Germany	US	UK	Sweden	Denmark	Norway
mean of EPL-index 1995-1999 (OECD, 2004b)	2,8	0,2	0,8	2,8	1,6	2,4
unemployment protection (Estevez-Abe, Iversen and Soskice, 2001)	0,77	0,10	0,11	0,63	0,91	0,64

1.3.3 Sweden, Germany and the United States: Three Institutional Settings for International Comparative Research

Taken together, the three countries qualify well for a comparative study on the differentiation of educational careers and its consequences for inequality. Other countries could have chosen as well, as their education systems are equally open. However, for Denmark and Norway the availability of micro data has turned out to be far more difficult than for Sweden. Furthermore, the labor market intervention in Denmark differs more strongly from Germany than in Sweden. On the other hand, a comparison with Denmark might be a fruitful extension in the future since it has a vocational education system which is similar to the German one[4]. Labor market intervention also rules out the case of the U.K., which differs less from Sweden than the US. The question is then rather whether to choose either the US or the U.K. The US is more consequent and has a longer tradition of flexibility in the education system, which makes it a more distinct case. Moreover, the postsecondary education system in the U.K. differs between Scotland on the one side and England, Wales and Northern Ireland on the other side (Eurydice, 2000b). This circumstance would introduce additional complexity for comparison.

Finally, the availability of previous research and of good longitudinal micro-data is a strong argument for my choice of country cases. Comparative case studies on inequality or life course research often compare these three cases, compare couples

[4] See for example the Eurypedia-web archive: http://eacea.ec.europa.eu/education/eurydice/eurypedia_en.php (access date March 24, 2013).

out of this triple, or at least contain the three cases as a sub-set of a larger group of comparison countries. DiPrete summarizes the situation of research concerning these three cases as follows:

> 'While gaps in our knowledge about life course mobility in these countries still exist, the available evidence from an increasingly extensive research literature produces a comparative picture that, as I will argue, meets the test of reasonableness for both parsimony and plausibility.' (DiPrete, 2002, p. 279)

Indeed, as the overviews of DiPrete (2002) and Mayer (2005) show, there exist already a large number of studies for these countries with regard to life courses and various aspects of social inequality. However, postsecondary educational careers and their relation to a standardization of life courses are not studied much within this literature (see Brückner and Mayer, 2005 for one of the few exceptions of a Germany-U.S. comparison). Given the similarities of this sub-system in Sweden and the US and the extreme position that West-Germany took for a very long time, this is surprising. Extending previous research into this direction, I argue, can thus be a part which is yet missing in the picture.

Having justified my case selection, I will now explicate all of the three cases in more detail. The following chapter 1.4 will describe the education system and the labor markets of Sweden, Germany and the US one by one. This serves as background information for the subsequent development and testing of macro-hypothesis. Readers being familiar with the three education system might thus easily skip this section.

1.4 The Education Systems of Germany, the US and Sweden: Setup, Transitions to Higher Education and Inequality

This chapter summarizes background information on the three country contexts Sweden, the US and Germany focusing the education system and the labor market. By contrast to the previous chapter, this one will summarize facts in more detail instead of analytical discussion. These institutional areas will then later be the core explanation when developing hypotheses for the country differences. The descriptions stress the differences on the dimensions of stratification, standardization, the openness for non-traditional students and the coordination mechanism which have theoretical significance for the discussions in section 2 and 3. The time frame I refer to are the 1990's and early 2000's. I further give a first descriptive overview over the phenomenon of interrupt and delayed education and inequality by social origin in this context. This serves as an illustration that there exists variance on the macro-level also on the dependent variable, while a more careful description of educational careers is needed to capture the relevant country characteristics properly and will follow from section two onwards. Readers who are familiar with the three systems could skip this chapter.

1.4.1 Germany

The formal requirement for entering tertiary education in Germany is the *Abitur*-degree or a vocationally oriented *Fach*-Abitur/*Fachhochschulreife*-degree obtained at the end of upper secondary school. Tracking in secondary school is rather rigid, and not all tracks directly lead to a qualification for higher education. The only direct track towards higher education entry certificates is the *Gymnasium*. Due to the early pre-selection of students, only a minority qualifies for higher education at the end of secondary school. Those students visiting the lower tiers of secondary school, *Hauptschule* and *Realschule*, have different possibilities, e.g. becoming eligible to the lower tier *Fachhochschule* or the full higher education system through vocational education.

The German higher education system is commonly classified as a 'binary stratified' system (Goedegebuure et al., 1996; Teichler, 1993) as it is (mostly) a two-tier system with universities and lower tertiary institutions (*Fachhochschulen*). The

Fachhochschule or so-called 'University of Applied Sciences' offers vocationally oriented tertiary education. This lower tier of the system was expanded in the 1970s and is limited to a narrow range of fields such as engineering, business and administration of social services (Huisman, 2003). Universities engage into research and teaching in all academic fields, offering courses in many more fields of study, including the 'traditional' professions such as law or medicine. There has been a clear difference in status between these two types of institution (Teichler, 1993). Almost all tracks are terminal, granting degrees of varying occupational specificity. Entering a certain track therefore implies the decision to obtain a certain terminal degree. Returning to the educational system thereafter means obtaining more than one terminal degree – usually with no (or only minor) credit transfer to the new program. As a consequence, Germany counts as a typical case of parallel stratification in higher education.

Study programs are organized in a similar way in both tiers, although the completion of a degree at the *Fachhochschule* takes slightly less time than the standard duration of university studies (eight instead of nine or ten semesters). Hence, in both institutions at least four to five years have to be spent studying before obtaining a degree. As a result, a decision for tertiary education represents a major investment.

State coordination and intervention in higher education in Germany is comparatively strong. The federal states are responsible for providing higher education and control the budgets of higher education institutions. They also accredit programs of study, are involved in the hiring of professors, and determine the salaries of university employees (Mayer, 2003). This leads to high degrees of standardization in study programs. Although the content, number, and type of final exams are regulated by each university separately, universities are considered to be more or less equal in quality, and there is no particular hierarchy among universities. During the 1990´s there were no tuition fees for public institutions of higher education. These have been introduced in the early 2000´s and will be abolished again by most states within 2013. Universities are the most prestigious institutions with the highest returns in the labor market (Müller, Brauns and Steinmann, 2002).

A postsecondary alternative to studies in higher education studies is vocational education in schools or (more common) through apprenticeship training. Apprenticeships consist of in-company training, complemented by part-time

vocational schooling which usually lasts 2 to 3 years. Entering the labor market with only upper secondary education is uncommon. However, many young adults who are qualified to enter higher education choose this option (Jacob, 2004). Between 2000 and 2008, approximately a quarter of all students who were qualified to enter higher education enrolled in vocational training half a year after leaving secondary school (Heine and Quast, 2009). It seems that many upper secondary school-graduates perceive apprenticeships not as second best choices. Empirically, it could be shown that this alternative is often used by young adults with lower educational background (Becker and Hecken, 2009b). However, for many young adults completion of an apprenticeship is not the end of their educational career. A part of the graduates from vocational training who are eligible to higher education enroll into the tertiary level education. Heine and Quast (2009) report for the years between 2000 and 2008 numbers between 15 and 20 percent of those young adults qualified for higher education aiming for both a vocational and a higher education degree. Others choose spontaneously to re-enroll after completing vocational training.

Most importantly, the higher education system was not very open for non-traditional students who enter later. Part-time studies or shorter programs were uncommon and flexibility in curricula and class-schedules was limited. Long study programs without opportunities to interrupt imply a long term commitment and are thus less attractive for potential older students who are already established in the labor market.

1.4.1.1 Recent reforms

With the aim of harmonizing higher education in Europe, the Bologna reforms have changed the organization of studies in Germany fundamentally. Almost all study programs were affected. At their core, the Bologna reforms impose a new structure with a sequential Bachelor- and Master-degree program, but there are far more aspects of this development. Most importantly, one aim which is much less discussed was to foster the role of higher education for lifelong learning. In the European Union report on the implementation of the reform, entire chapter six reports on this matter (Education Audiovisual and Culture Executive Agency Eurydice, 2012). In particular in section *6.4.* being entitled '*Promoting flexible delivery of higher education programmes'*, the efforts towards flexibility of higher education institutions for all

countries are summarized. Germany has done comparatively little yet, in particular the provision of part time studies is much less common than in other European countries. However, German representatives state the aim of developing into this direction is explicitly:

> 'Germany indicates that even if there is no formal part-time status, higher education institutions have autonomy to offer part-time studies and several Länder have adopted legal regulations covering this type of study (Education Audiovisual and Culture Executive Agency Eurydice, 2012, p. 136).'

Similarly, the proportion of students who interrupt their educational career between the secondary and tertiary education is still rather low. The percentage of students in tertiary education who are 30 or more years old is with 14 percent among the lowest in Western Europe. By comparison, Sweden reaches already a share of over 35 percent. In another aspect of flexibilization – the recognition of prior learning for access to and as credits in higher education – Germany is now already classified as one of the leading countries. Even though the development seems to be slow, institutional changes suggest that Germany is moving towards a more flexible system for adult learners. The recognition of prior learning has been introduced legally in 2002, and by 2012 all German states have institutionalized rules for access of students without formal qualification to enroll in higher education (Bundesministerium für Bildung und Forschung, 2012, p. 31). Further, in the same report to the European Commission, the federal government urges states and higher education institutions to improve the possibility to combine studies with other areas of life. Mentioned are childcare and work. From the federal government, a studentship for upward social mobility ('Aufstiegsstipendium') for adults with completed lower vocational degree has already been introduced. These and many other measures show that policy makers are making serious attempts to offer more flexibility in higher education careers and open the system to a broader group of potential students. As a consequence, the German postsecondary education system offers more and more features that are common in the most flexible countries such as the US and Sweden.

Figure 1.4.1: The educational system of Germany.

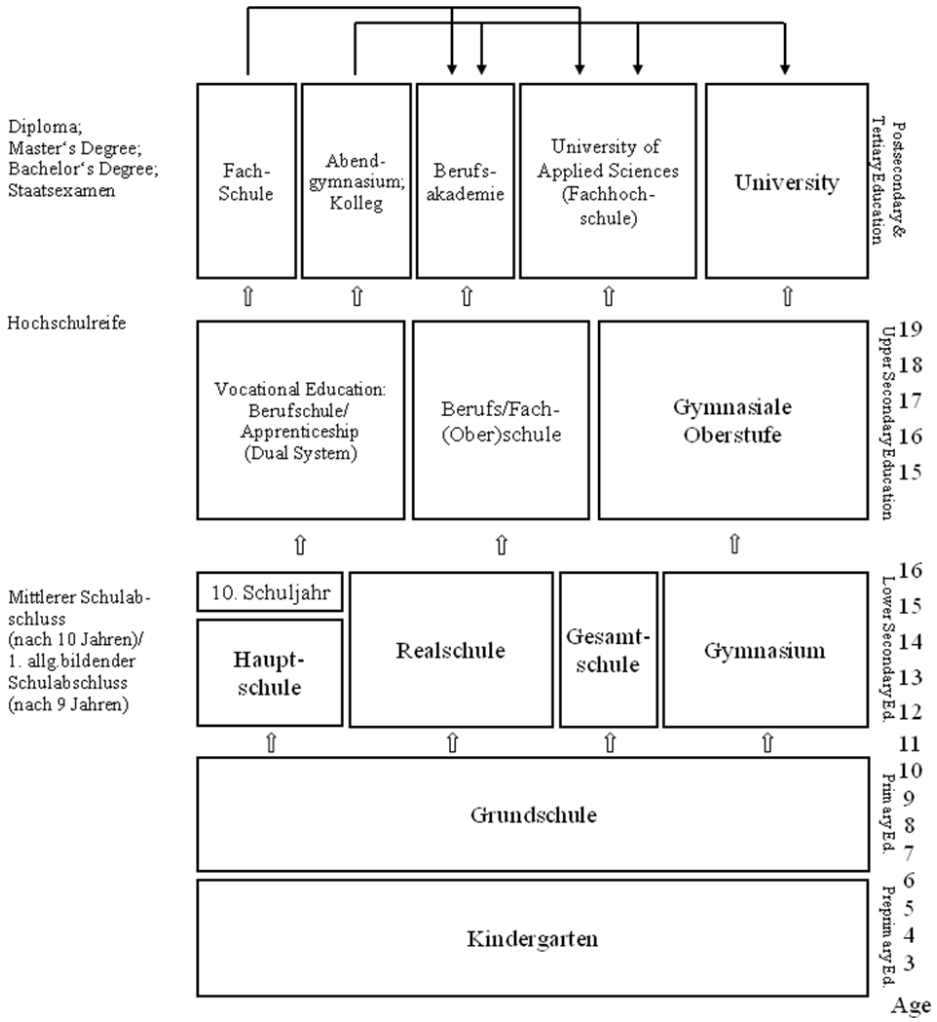
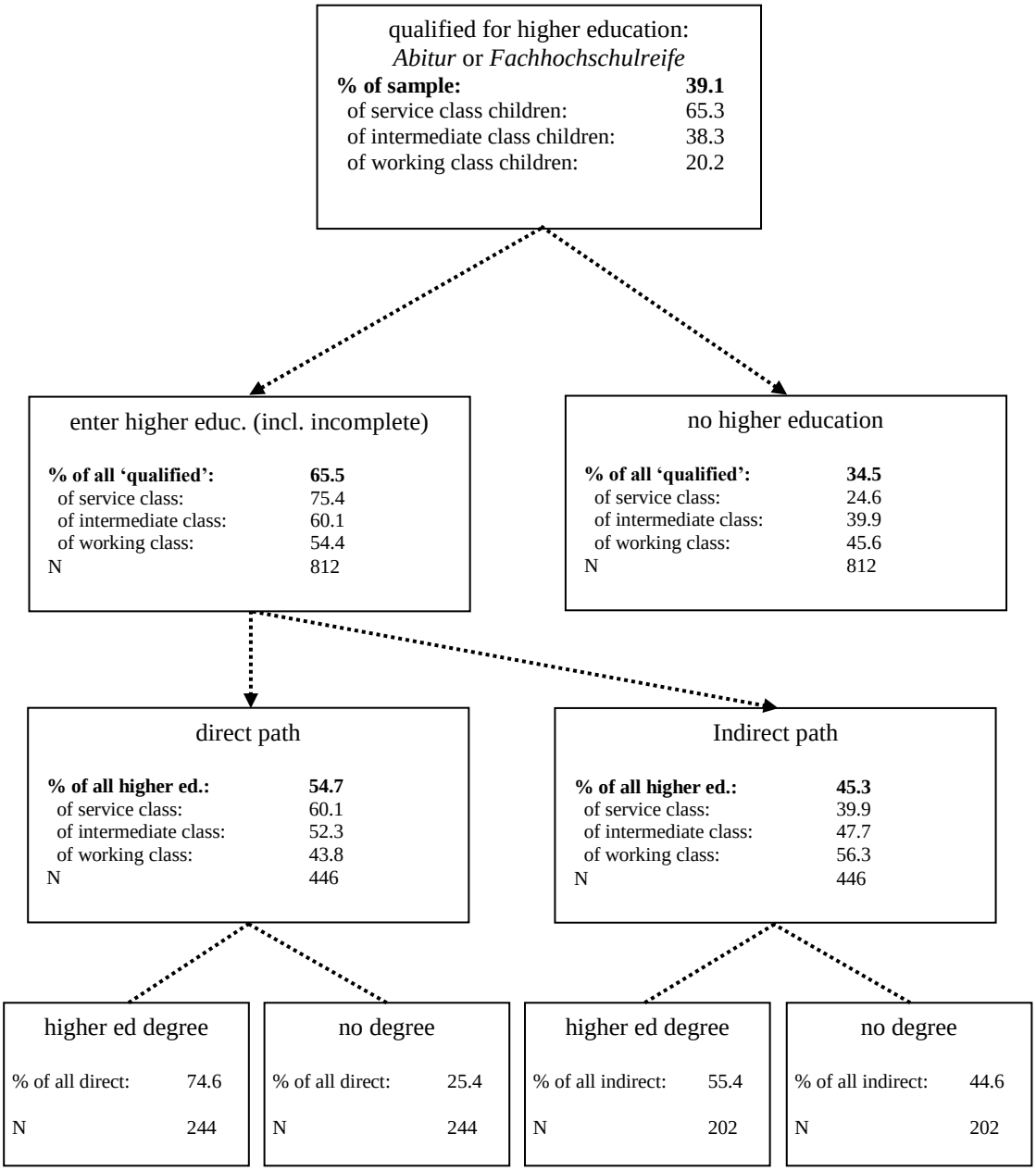


Figure 1.4.2: Social origin and participation in higher education in Germany: the GLHS sample.



Note: Class of origin categories are explained in chapter 1.5
Data source GLHS64/71, own calculations.
Not weighted.

Figure 1.4.2 shows how the sample of the (West-)German Life History Studies 64 and 71 (GLHS) moves through the education system. The set-up abstracts much from the educational system itself as depicted in figure 1.4.1 in order to enable later

comparisons to other systems. Both the overall transition rates and the rates by class of origin are reported. The numbers document the elitist nature of qualification for higher education in Germany: on average only 39 percent of the sample achieves at least eligibility to the lower tier higher education. While about 65 of the upper classes (service classes) arrive there, only 20 percent of the working classes realize this. Further inequality adds up on that at the transition into higher education. The indirect pathway is not even so uncommon and almost half of all young adults who eventually enroll, among the working class children even 56 percent, arrive there via a detour. These detours mainly consist of 'double qualifications', i.e. the completion of both vocational (apprenticeship-) training and higher education, which cannot be seen in figure 1.4.2.

The last row the completion rates of higher education, broken down by the educational career pattern. Three out of four students with a direct educational career track eventually achieve a degree, while the respective share among those who interrupted is only about two out of four.

1.4.2 United States

In the US, graduation from high school or passing the GED exam provides formal entitlement to enroll in higher education. In contrast to Germany, the majority of students take this hurdle. While the American system of higher education is often classified as 'diversified' in terms of stratification (Goedegebuure et al., 1996), the institutional setting is mainly twofold. The upper tier are research universities (or full four year colleges) as the first tier, with selective admission procedures offering classes in liberal arts and scientific education, and granting Bachelor, Master, and doctoral degrees (Lucas, 2006; Thelin, 2004). Within this system, studies are structured into an undergraduate and a graduate period. The second tier consists of community colleges or two-year colleges, providing rather open access and offering transfer classes of two years leading to 'Associates of Arts' degrees (A.A.) for continuation in higher education or terminal vocational education. In community colleges, transfer classes and terminal courses channel the students to different final levels of education. By offering specific credit requirements and high class-time flexibility in their programs – and therefore the possibility of temporary drop-out – community colleges often cater for part-time students and older students returning to

education (Arum and Hout, 1998; Brint and Karabel, 1989; Cohen and Brawer, 1996; Grubb, 2006; Roksa et al., 2007). In contrast to Germany, study programs in both universities and community colleges are sequentially stratified, i.e. a transfer into another program after a certain time is expected. The possibility of entering the labor market at these thresholds within the higher education career or continuing with one's studies implies flexibility in the planning of educational careers. The decision for or against participation in tertiary education is broken down into several smaller decisions at different stages in the life course.

Further, the American system of higher education can be described as market-coordinated, as intervention in matters of higher education by the government is very limited, and universities compete for students e.g. by offering an environment of selective admission and/or reputation, or by offering flexible study schedules. State intervention concentrates on support for students, predominantly by loans. The state does not play an active role in shaping the institutions of higher education (Roksa et al., 2007). Degrees are not very standardized, e.g. (community) colleges sometimes offer very specialized degrees in contrast to the very broad liberal arts degrees.

Comparing the two education systems (see Table 1 for a summary) reveals that the American system offers more opportunities for the interruption of educational careers than the German system. In section 2.5 I derive some more specific hypotheses on the national differences.

Figure 1.4.3: The education system of the United States.

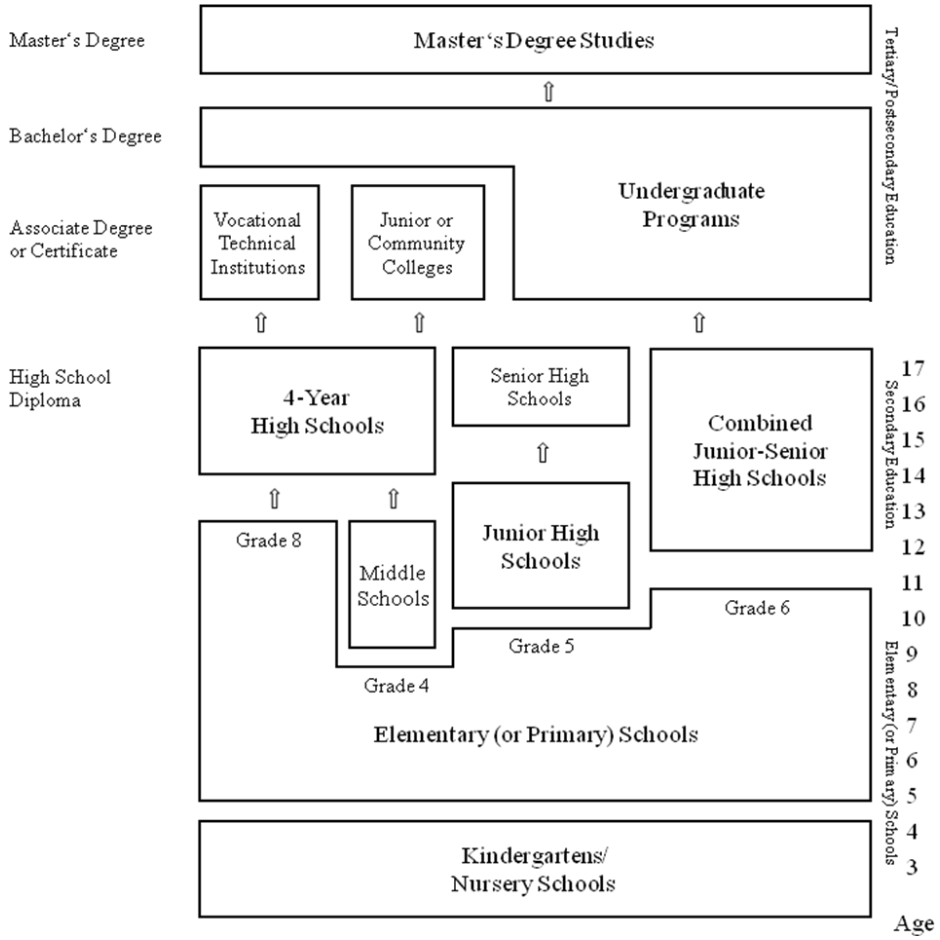
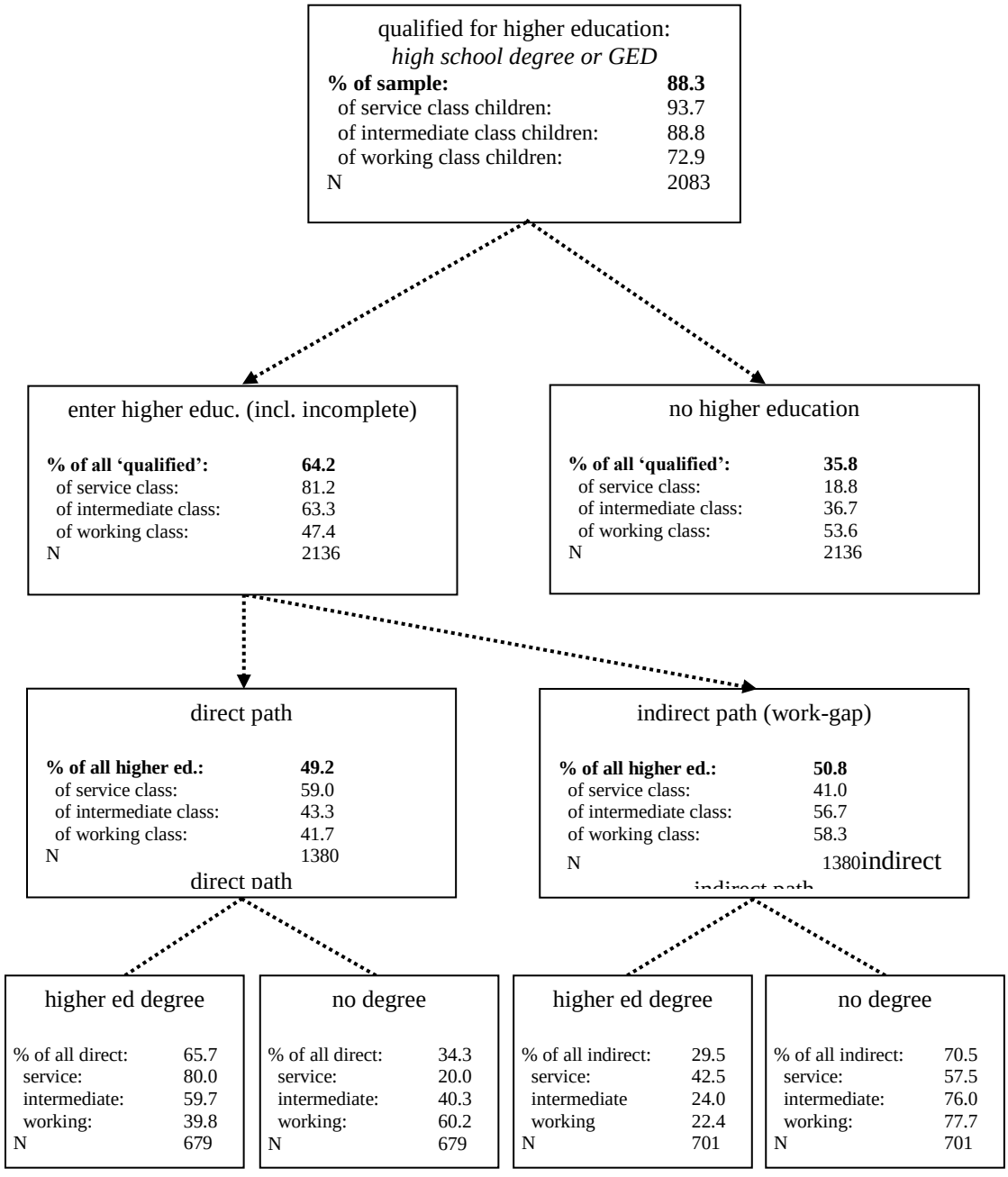


Figure 1.4.4: Social origin and participation in higher education in the United States: the NLSY79 sample.



Note: Class of origin categories are explained in chapter 1.5
Data source NLSY79, only cross sectional samples, own calculations.
Not weighted.

The US system is less selective in the minimum entry criterion for higher education which is achieving a high school diploma or GED than the German one. Nevertheless,

educational inequality already exists in this step of comparatively weak pre-selection. In the second step asking whether any entry into higher education occurs, inequality is quite high. Entering higher education is operationalized as being enrolled for at least three months continuously in a two- or four-year college until age 32, which explains the high overall coverage rate. While only 47 percent of lower class children participate in higher education, 81 percent of the service class children can enroll. About half of the sample takes some indirect way; the other half has a rather straight educational career. The number of 'standard students' seems very low compared to the findings of other authors (e.g. Adelman, Daniel and Berkovits, 2003; Adelman, 1999; Adelman, 2004; Adelman, 2006). Note however, that drop-outs with a single spell who enter before having worked for six months in a full time job are included in the continuous group. As in the case of Germany, this inconsistency shows that the structure of educational careers is more complex and needs a more thorough description which will follow in section 2. What can already be spotted in the simple description in figure 1.4.4 is that there exists inequality by social origin in the question if students follow a straight pattern or take a detour. In particular the most privileged classes (service classes) have a high share of direct educational career patterns.

In the last row of figure 1.4.4 the completion rates are reported. First, in accordance with previous evidence (Kempner and Kinnick, 1990), it shows that direct pathways through the system more often lead to a degree. Second, completion constitutes another important dimension of inequality in the US. Within both groups – interrupting and non-interrupting higher education students – the share of completions among the service classes doubles that of the working classes.

1.4.3 Sweden

The Swedish education system has undergone several reforms during the second half of the 20th century, some of them with the explicit purpose to promote equity and enable flexibility between different tracks and sectors of it. At the same time, an increase of postsecondary choices and an expansion of university education (Erikson and Jonsson, 1996b) took place. In the 1990´s, a series of reforms followed which promoted competition between schools and assigned private institutions stronger roles than they had before (Björklund et al., 2005).

For simplification, schooling over the life course in Sweden can be categorized into three broad phases (Halldén, 2008). Since the 1970´s, all students in Sweden have to complete a nine year comprehensive compulsory school (*Grundskola*). Following this, students choose between different alternatives of upper secondary school programs (*Gymnasieskola*) and after completion enter the third cycle, the tertiary education system provided by universities (*universitet*) and university colleges (*högskola*). Almost all students transfer to upper secondary school, but most of the programs were vocationally oriented, especially before the 1990´s, i.e. at the time when the majority of the sample I analyze passed the system. The large majority of vocational programs are school based; apprenticeship training plays a minor role. Program duration is now generally three years, but used to be two years until the 1990´s for the less demanding vocational tracks. The programs either lead into the labor market or into continuing studies in higher education.

Defining the group of young adults who are eligible to higher education in Sweden is extremely difficult (cf. Jonsson and Erikson, 2007). As a general requirement, students need to complete at least two years at an upper secondary school and this has to encompass at least two years of studies in Swedish and English (Swedish Ministry of Education and Science, 1993). The grade point average achieved in upper secondary education is a central criterion for admission to higher education, but there are other criterions such as scores in national university tests, age and work experience (Halldén, 2008). The latter is certainly a central institutional characteristic of the Swedish system with regard to non-traditional students and 'patchwork-careers' in education. In 1970 the rule was introduced that everyone with gainful employment of at least five years (later: four years) or an age of at least 25 years was eligible to enter higher education, although a quota limited the number of admissions through this track. Hence, every Swedish pupil will become theoretically eligible to higher education at some point in the life course. However, this is only nominal eligibility and strong hurdles might apply in practice, since universities are free to introduce a numerus clausus and there is a quota for places being filled according to the 25/4-rule.

Higher education in Sweden is organized in three tiers (Jonsson and Erikson, 2007). The lower vocationally oriented tertiary track (*Högskola*) lasts normally less than three years; the higher tertiary track providing scientific training in a diverse range of fields of study (*Universitet*) and offering B.A. and M.A. degrees; an finally

the occupational oriented professional university programs ‘with longer study times of 4-7 years, such as law, medicine, business administration, and civil engineering’ (Jonsson and Erikson, 2007, p. 123). The majority of the programs are sequentially stratified into B.A. and M.A. degrees and the Högskola offers even shorter programs. The main line in parallel stratification divides the institutions into two tiers: the *Universitet* as the upper tier and the *Högskola* as the lower tier. The Swedish government coordinates higher education centrally and a very large majority of universities and university colleges are public. The government also introduces the *rector*, the head of the institutions. There is on the other hand some freedom for universities to offer study programs according to local needs or enable students to follow their individual study program if required.

Different features of the Swedish postsecondary education system make it a comparatively welcoming environment for adult learners. The expansion of postsecondary education has also led to geographical diversification in particular of the university colleges into the different counties. ‘Since 1998 each county in Sweden has at least one university or university college’ (European Commission, 2013). In combination with the availability of distance studies, this reduces costs and removes difficulties in particular for less mobile adult students. In 1993, the share of distance students cover was 8.4 percent of all students, which increased rapidly thereafter (European Commission, 2013). A grant system offers support to the majority of the students in higher education while there are no tax benefits for parents (European Commission, 2011). The generally strong focus on adult learning is also mirrored in programs outside the postsecondary education system. Also secondary education is widely available for adults. Local municipalities are responsible to provide adult education with curricular standards which are defined under the *komvux* (kommunal vuxenutbildning) framework.

Figure 1.4.5: The Swedish education system.

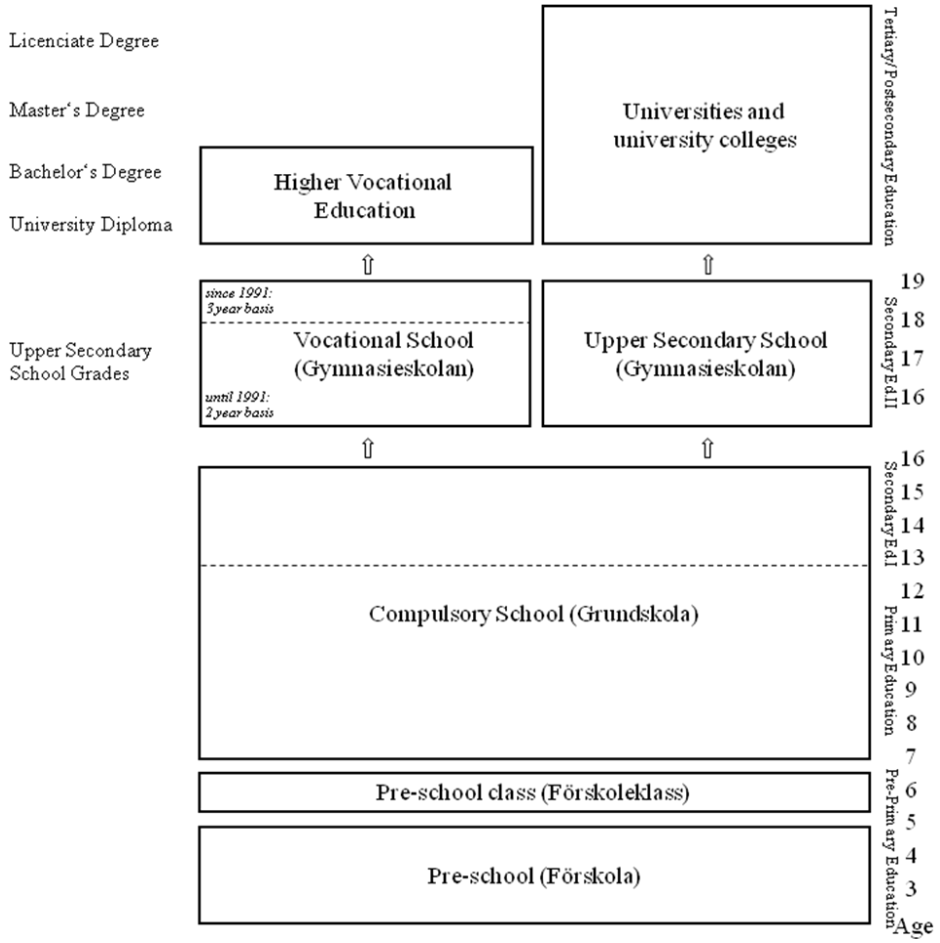
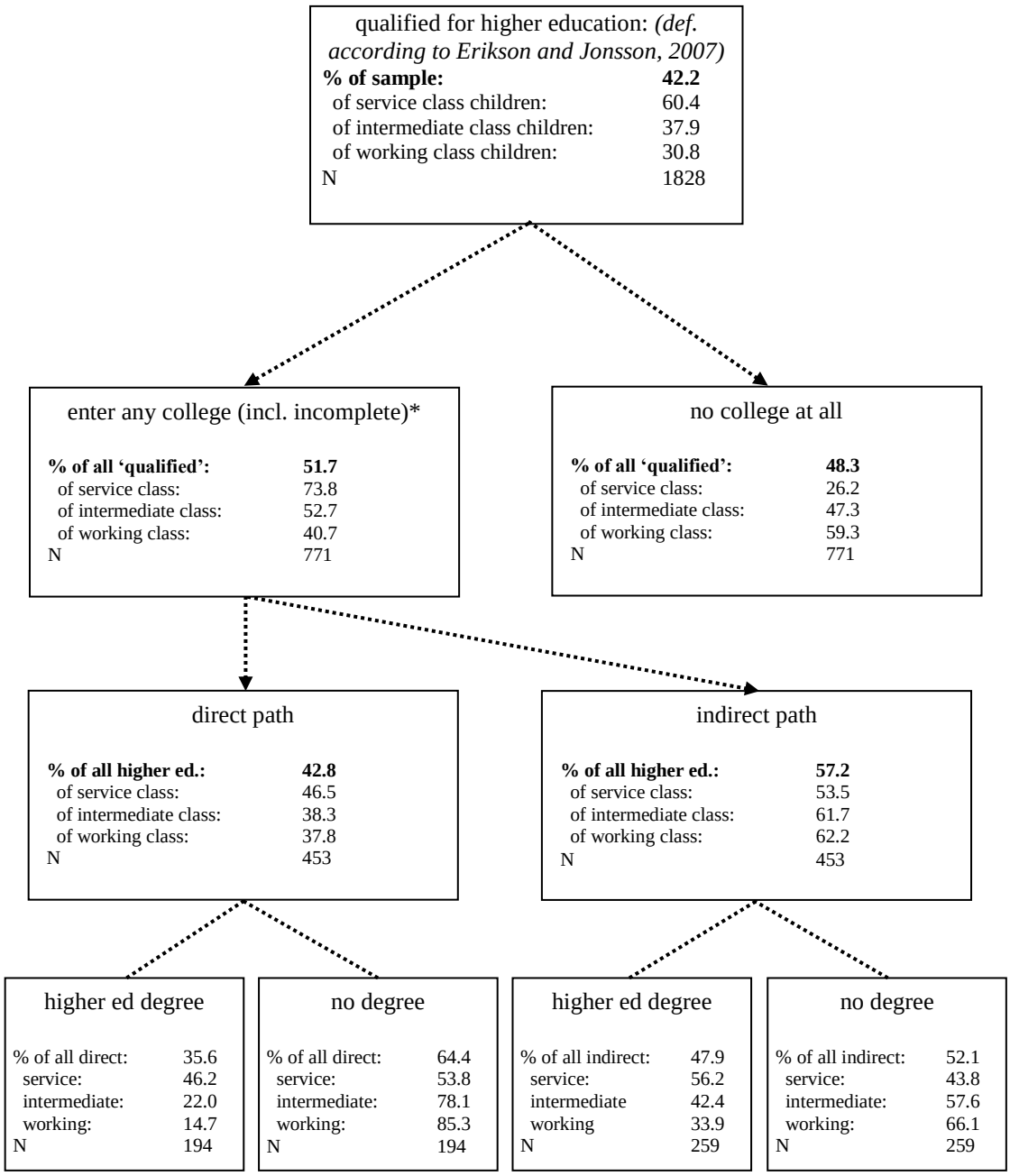


Figure 1.4.6: Social origin and participation in higher education in Sweden: the LNU sample.



Note: Class of origin categories are explained in chapter 1.5
Data source NLSY79, own calculations.
Not weighted.

Figure 1.4.6 shows some basic facts on the educational careers of Swedish young adults in the sample I will analyze later. Eligibility (here not defined as all nominally eligible persons, defined according to Erikson and Jonsson, 2007, which captures those individuals who can enter 'easily') is reached by less than half of the cohorts

which I included in the analysis sample. Inequality in direct achievement of entrance qualification for higher education is high; the share among working class children is half the share of children from the upper classes (service classes). Taking only those students directly qualifying, more than half of them enter higher education, with again a remarkable underrepresentation of the lower class students. Even among the directly qualified higher education students only about 40 percent have un-interrupted educational careers, with again more direct careers among the upper class students. This result points towards a high relevance of interruptions and later studies in Sweden. Full degrees are, however, more often achieved among those students who interrupt. Note that this representation is somewhat misleading in the way that there are shorter programs which do not offer full higher education degrees (university colleges), but their shorter duration offers lower chances for interrupting ones educational career. It is therefore not quite correct to talk about completion, which would require further examination.

The descriptions of the education systems of the three countries serve as background for the coming chapters. I have not highlighted so far, how institutional structures I have described above may shape social realities in the three societies. The aim was rather to summarize some empirical facts to prepare the ground for such a comparison. Beyond, the simple analyses in the figures summarizing how different social origins groups move through the education system highlight the relevance of studying higher education beyond access. There are not only pronounced differences in access opportunities to higher education and in access itself, but also in the pattern of the educational career (interrupted or straight) and in the completion rates. In the following, I discuss the former in detail and in comparative perspective between the three countries. After describing the microdata-sources and the central independent variable on the micro-level, social origin, I continue in section 2 by comparing the time patterns of postsecondary educational careers between the three countries. Understanding the institutionalization of educational careers by different systems seems to be a pre-condition for developing hypotheses on differences in inequality in educational career patterns thereafter.

1.5 Data Sources

Below I introduce the datasets I analyzed for the empirical sections 2 to 5. I will also shortly discuss some of the strength and weaknesses and give some reasoning why I chose to analyze the respective dataset.

All analyses within this volume are based on secondary data analyses of data other researchers have collected. Thus, the datasets were not produced with the aim of best fulfilling the requirements for studying educational careers from a life course perspective. Nevertheless, I was able to use three datasets which I consider suitable as the core datasets for the majority of the analyses: the Swedish LNU, the German GLHS and the American NLSY79. These datasets had to fulfill at least three basic features: first, they needed to capture the life course in a longitudinal way including detailed information on educational and occupational careers. Second, social origin as the key dimension of social inequality must be measured sufficiently detailed. And third, they had to have the potential to allow at least a basic comparison between countries on the central concepts. Beyond these three main datasets I have used other data from Germany to extend my analysis in a number of details or back up my findings with larger data sources. On the coming pages I introduce all of the data sources and briefly discuss their strengths and weaknesses with regard to my research question.

1.5.1 The German Life History Study (GLHS)

The main dataset used for most analyses on Germany will be the German Life History Study (GLHS). This retrospective study contains information about the educational and labor-force status on a monthly basis (Max Planck Institut für Bildungsforschung, 2004; Mayer, 2006). I draw on nationally representative samples from the birth cohorts 1964 and 1971. Both cohorts were interviewed in 1998, and those born in

1971 were also interviewed in a second wave in 2004. For this cohort, I use cases with valid observations in both waves only.

This dataset has several advantages for the purpose of studying postsecondary careers. First and foremost, it has been collected with the aim of providing a database for research on inequality from a life course perspective. Central concepts I am referring to, such as social origin, school attendance or occupational careers are therefore all included in the data. Furthermore, the data quality is high, as several indicators show. A response rate of 66 percent (Mayer, 2006, p. 31) might be seen as low by international comparison, but stands out as a high result compared to other German studies. During collection of the GLHS data, much research has been invested in the modes of data collection, such as methods for improving autobiographical memory. The collected data files were edited thoroughly by the research group at the Max Planck Institute, using a multitude of information and examining each case on internal consistency. Even telephone inquiries with the respondent or tape records from the interview were used if the respondent had agreed in recording.

As to any data source, several limitations apply to this data set as well. The retrospective nature of the survey did not allow asking for 'soft facts' such as opinions or aspirations which are often not remembered correctly. For my research, this mainly implies a lack of measures for scholastic performance beyond the GPA from the school-leaving certificate. Another drawback is the small sample size of individuals being qualified for higher education. Hence, for several sub-analyses within the context of Germany, I used alternative datasets or added other data to the GLHS.

1.5.2 The Study 'Arbeit und Leben im Wandel' (ALWA)

The 'alwa'-dataset (Antoni et al., 2010) follows a similar design as the GLHS and comprises retrospectively collected life course information of about 10,404 respondents. Interviews took place in the years 2007 and 2008 and cover a broad range of birth cohorts. In order to ensure comparability, I limited the dataset by selecting the cohorts born between 1960 and 1974.

The response rate in the computer assisted telephone interviews amounts about 46 percent of those target persons from whom a phone number could be found (24 percent among the total target population). The vast majority of the interviews

were conducted in German language, with some exceptions for migrants for whom the interviews were completed in Turkish or Russian. The data-structure and much of the information included is similar to the GLHS, but for a larger number of cases. However, the suitability for my research is limited by a number of weaknesses. The most important disadvantage compared to the GLHS is the less detailed information about social origins. While the GLHS has information on both occupation and education of the parents in great detail, information on parental occupation is rather basic in the case of ALWA. Furthermore, information on the educational career is somewhat less detailed in places. Therefore, I analyze the dataset only for section 2 on educational career patterns, but not for section 3 on inequality in educational career patterns and transitions.

1.5.3 The National Longitudinal Study of Youth 1979 (NLSY79)

For the US, I select sub-samples from the NLSY79 (U.S. Department of Labor, 2008) which vary somewhat over the chapters. The NLSY79 is a cohort panel study representative for the US population containing 12,686 cases at its start-up in 1979. At that time, the respondents were between 14 and 22 years old. They were interviewed annually (from 1994 biannually) about a broad range of topics involving detailed information about educational attainment. Labor force status and the number of hours worked are available in weekly arrays.

The response rate for the initial interview in the sub-samples I selected was 90 percent of all people designated for interviewing. From then on, annual response rates continued to be high. In 1994, when the study moved from annual to biannual interviews, the response rate was still 89 percent of all respondents who completed an interview in 1979. In 2006, at the time of the last interview which I will use within this volume, the rate had dropped to 76 percent. Interviews were mostly conducted face-to-face, with a small minority of telephone interviews upon the explicit desire of the respondent or the interviewer or for the reason that the respondent lived in a very remote area.

As I am interested in a cross-section of the American population, I have not used the sub-sample targeting specific populations (racial-, military- and poor-white sub-samples) in any chapter. Furthermore, I have restricted samples to the later cohorts in order to capture the entire educational career and because the IQ-testing

was conducted before completing high school. This reduces the sample sizes in some cases considerably to a remaining sample which is still large by comparison to the German and Swedish samples. In addition to the sample size, the NLSY79 has several strengths also compared with the datasets I use for the other countries. Social origins are measured in the same detailed way as in the LNU and the GLHS. For scholastic performance a direct cognitive test (IQ-test) is available in addition to other variables such as tracking in high school or the experience of being expelled from school. Further interesting concepts such as occupational aspirations were included into the survey. On the downside, the information on school marks in the transcript surveys has a large share of missing values and could not be used and the fact that the NLSY is a panel study introduces additional missing cases due to panel attrition.

1.5.4 The LNU (Levnadsnivåundersökningarna): Swedish Level of Living Survey

The LNU applies a mixed approach between panel and retrospective life history design. Respondents were asked about their full work and educational biography, and were also re-interviewed in decennial waves. This decennial panel data with retrospective life history information has been collected by the Swedish Institute for Social Research (Bygren, Gähler and Nermo, 2004).

The dataset has been conducted as well as the GLHS for the purpose of inequality research, but covers a broader range of topics. The response rates are high compared to the German datasets. In the 1990 and 2000 waves which I have used, 79 and 77 percent of the targeted sample took part in the study. Most respondents (84 percent) were interviewed personally face-to-face by Statistics Sweden (Statistiska Centralbyrån). In all other cases, telephone interviews were used (Gähler, 2004).

The LNU has similar strengths and weaknesses as the GLHS. On the positive side, it enables to reconstruct entire education- and work-careers and offers detailed information on social origins including parental occupation. The main drawbacks are a somewhat small sample size of higher education students and the scarce information on scholastic performance.

1.5.5 The HIS Panel Study of Young Adults Qualified for Higher Education in Germany

In chapter 4.1, I analyze the 1999 HIS Panel Study of young adults qualified for higher education (Durrer and Heine, 2001) which is a mail survey in two panel waves. The first of these was conducted six months after the young adults left secondary school and the second wave three years later. The study covers educational career intentions in the first wave. In the second wave, retrospective information about the actual pattern of the educational and labor market career is collected. Parental educational achievement is measured, as well as a rich set of variables describing the previous educational achievement of the respondents, e.g. type of secondary schooling, school-leaving certificate and grades (GPA). The great advantage of this dataset with regard to the research question of chapter 4.1 is that the intentions for the future educational career are asked in the survey. Furthermore, a sufficiently large number of cases were available via remote access to the HIS-institute for analyzing smaller sub-groups (7,374 respondents who completed a questionnaire for both survey-waves).

The data has, however, several limitations urging me to use them only for the specific question of chapter 4.1 and not for any of the other analysis. The documentation, in particular with regard to response rates, is scarce and the rate can therefore be expected to be low. The questionnaires were long and asked a large number of attitudes on a rather small space of paper, and the item-nonresponse is high – due to the given methodology. The operationalization of parental social class is only possible in a strongly simplified form and not comparable to the other datasets. Right censoring occurs already five years after completing upper secondary school, and the coding of the data does not even allow to fully reconstructing life histories for this period. Even though these limitations are severe and one can doubt in particular about the descriptive findings from it, the dataset was the only possibility to scrutinize educational intentions and I therefore analyzed them for this specific extension of theoretical significance.

1.5.6 The HIS Panel Study of Graduates from Higher Education in Germany

In chapter 5.3, I analyze the graduate surveys of the HIS (Hochschul-Informations-System). Several cohorts of graduates from higher education in Germany are surveyed

six months after graduation and in a second panel wave five years thereafter. However, only two cohorts are available as scientific use file, the graduate cohorts of 1997 (Fabian, 2006; Fabian and Minks, 2006) and of 2001 (Schramm and Beck, 2010) which I used as pooled sample. The usable sample consists of 8,105 graduates. The data was collected as a self-report mail survey at random sample of graduates from a large number of German universities. According to HIS, the dataset qualifies to make representative inference on the German graduate population (Schramm and Beck, 2010).

Certainly, doubts can be raised about self-reported mail surveys with low response rates and no interviewer control over the response process. Furthermore, the documentation of the response rates misleadingly reports the percentage of interviews among all graduates of the cohort, but not of the number of graduates who had received a questionnaire. For the later cohort, the documentation is better and a response rate of roundabout 30 percent in the first wave and 75 percent of first-wave respondents in the second wave is documented. Nevertheless, the data quality raises doubts which led me to refrain largely from descriptive analyses based on these samples. Furthermore, I have used them only for the sub-questions where no other data source with sufficient sample size could be found.

2 PATTERNS OF POSTSECONDARY EDUCATIONAL CAREERS IN THREE SOCIETIES – THE INDIVIDUAL PROCESS OF EDUCATIONAL ATTAINMENT IN DIFFERENT INSTITUTIONAL STRUCTURES

This chapter discusses how individual educational biographies are shaped by institutions. I compare Sweden, Germany and the US from the perspective of looking back over careers that led to a certain outcome. I.e. I ask in how far students in different countries diversify into different educational career patterns, given they achieve higher education. With the usual perspective on pronounced differences in their welfare state systems, the US and Sweden resemble certain characteristics that lead to a similar flexibility in educational career patterns – even though central aspects of financing and labor market institutions differ. Germany stands out as a rather inflexible system, with much pre-sorting of higher education students which leads to much more ordered and institutionalized educational careers. This also implies the consequence that educational decisions are hard to revise and determine later achievement to a large degree. The macro conditions of these country differences are discussed theoretically. In order to illustrate these processes, the chapter applies a descriptive sequence analysis approach.

The following publication is a previous version of this chapter:
Jacob, Marita, and Felix Weiss (2010): From higher education to work patterns of labor market entry in Germany and the US. Higher Education, 60, issue 5, p. 529-542.
This chapter extends this work by an application of a wider range of methods and the inclusion of Sweden as an additional case. Further, replications for the German results with a new dataset (ALWA-data) are now included as well for several analyses.

2.1 The Transition from School to Work for those Eligible to Higher Education

In many industrialized western countries we observe prolonged transitions from school to work which are characterized by longer participation in education, times of early work experience during school and times in which employment is the major activity. Both activities, being in education and being employed, may overlap or the decision to leave education might be revised by leaving the current job and returning to school. Intertwined educational careers and labor market entries pose several substantial and theoretical challenges for research: on the one hand, the results of comparative research usually have to rely on very broad definitions of labor market entry. On the other hand, returning to the educational system after some working experience might decrease or increase social inequalities, depending on the social composition of those who decide to prolong and complement their education. In this chapter I focus on the first of these two questions. I.e. I aim at describing labor market entry patterns in more detail to elaborate further on country differences and differences in the standardization of these patterns due to specific institutional conditions of both, the system of postsecondary education and the labor market.

Previous comparative studies of the transition from school to work have shown that transition patterns differ across countries due to different (secondary) educational systems, labor market structures and their relation (Kerckhoff, 2000; Leuze, 2010; Müller and Gangl, 2003a; Scherer, 2001; Shavit and Müller, 1998; Wolbers, 2007). However, these comparisons rely on a rough definition of labor market entry, often neglecting the complexity of leaving education and entering work. Studies for single countries, in particular the US, have highlighted that school and work careers in young adulthood are far more complex than the ‘single transition’ definition presumes due to individualized patterns of higher education attendance (Adelman, Daniel and Berkovits, 2003; Adelman, 1999; Adelman, 2004; Adelman, 2006; Bradburn and Carroll, 2002; Carroll, 1989; Choy and Maw, 1995; DesJardins, Ahlburg and McCall, 2002; Horn and Carroll, 1998; O'Donnell and Chapman, 2006).

Whereas a lot of comparative research exists on the overall patterns of the transition from school to work in different institutional settings, only a few studies have gone into details e.g. by examining specific transitions from employment back to (full-time) education (cf. Brzinsky-Fay, 2007). Further, by mainly focusing on secondary and postsecondary vocational education, the specificities of higher education could not be elaborated. Although recently some comparative studies concentrating on participation and returns to tertiary education have been published (Allen and Van der Velden, 2007; Arum, Gamoran and Shavit, 2007; Kim and Kim, 2003; Triventi, 2011; Triventi, 2013; Triventi, forthcoming), these have not taken into account the complex processes within educational careers at this stage of the life course, i.e. interruptions to gain some work experience and re-entry into higher education to continue with one's studies.

This chapter describes transition patterns of students qualified to enter higher education and their ways through the higher education system if they enter. It extends the school-to-work perspective by a broader observation period up to age 34 encompassing learning in young adulthood within this important part of the life course. The main interest lies on the sequential order of education and work experience and the extent of the deviation from ordered and nationally institutionalized life course sequences that can be clearly separated into a phase of completed education and subsequently entering work. Furthermore, to describe the influence of the institutional setting of an educational system on the integration into the labor market, I compare three countries: Germany, the US and Sweden. These three countries differ in central aspects of the system of tertiary education, which constitutes differences in the institutionalization of individual educational choices and life course patterns. Whereas in Germany higher education is mainly stratified into two parallel tracks and into different fields of study leading to one level of final graduation, the American and the Swedish systems of higher education are stratified more diverse and but especially are sequentially stratified in addition, with more flexibility between different tracks and for non-traditional students. Hence, the institutionalization of education as an important part of young adults' life courses is low in this sub-system. The education systems provide flexibility of individualism in life course pattern, both in Sweden and in the US, which fall otherwise into quite different clusters 'national life course regimes' (Mayer, 2005, p.34/p.45). Not scrutinizing intertwined processes of different life course domains I focus on the

sphere of education instead. The general regime types might be most appropriate as a heuristic for describing such holistic patterns. However, a deeper view into one sphere might be able to uncover differences between the concrete structures better and in sum, together with other results of small scope, challenge the regime typology approach.

In order to illustrate the institutionalization of educational careers in comparison, a method is needed that somewhat abstracts from the country specific educational institutions. I will suggest a number of different solutions for the description of complex sequences representing life course patterns within a specific domain using a range of different indicators for institutionalization and individualization of life courses.

The chapter is structured as follows: in the next section I elaborate the theoretical background of the research question and discuss the relevant characteristics of the three systems of tertiary education (for a general overview over the systems see chapter 1.4). Against this background, I derive hypotheses on the patterns of educational careers and labor market entry in the three countries. After discussing the datasets used and the operationalization of the central concepts I present the results and the conclusions of the analysis.

2.2 Diverse Transition Patterns from (Higher) Education to the Labor Market as a Phase of Transition in the Biography

Previous research has found evidence for de-standardization and de-institutionalization of life courses in highly industrialized societies (e.g. Buchmann, 1989; Shanahan, 2000 for an overview). In this context

> '…*de-institutionalization* would (…) mean that states, stages, events and transitions, which at earlier times were clearly differentiated, are being reintegrated or fused' (Brückner and Mayer, 2005, p. 32).

One striking example of this trend of growing diversity in life courses is the transition from school to work, for example due to prolonged participation in education, phases of unemployment or jobs with precarious contract conditions (e.g. Brzinsky-Fay, 2007; Buchholz and Kurz, 2005; Hillmert and Jacob, 2004). The results of several studies suggest that the transition from school to work is less an ordered, institutionalized sequence of leaving school and entering work but a phase of different activities that overlap and last throughout adolescence and young adulthood. As a consequence of a 'spreading' of education throughout adulthood arrayed with and paralleled by work, labor market entry as an 'event' can often not be determined precisely (Brzinsky-Fay, 2007; Light, 1998). The two analytically defined events 'leaving school' and 'starting a job' are often empirically not clearly identified. One may rather speak about the first (or last) time of leaving school and the first job after leaving school - which might not actually be the last. Returning to school and re-entering work might occur. Hence, entering the labor market is a 'murky event' posing problems for comparative research that has to grapple with the operational definition of the first 'real' or first 'stable' job. Having said this, comparative research nevertheless succeeded in identifying typical national transition patterns: for example, in Germany the transition from school to work appears on average to be rather smooth in terms of lower youth unemployment and less job mobility in early working careers than in most other European countries (e.g. Müller, Steinmann and Ell, 1998; Scherer, 2005). In the US in contrast, the transition from school to work can generally be

characterized as a period of floundering. There is a much longer testing and trial period in the early working career that can be characterized by initially low-level and/or low-paid jobs, then progressing over the initial years in the labor market and often high rates of job mobility or transitions back to school (Arum and Hout, 1998; Coleman, 1984; Roksa, 2011; Rosenbaum, 1999). The rare results for Sweden have revealed a similar pattern: defining the 'real first job' is extremely hard, as transitions back and forth between the education system and the labor market occur frequently (Halldén and Hällsten, 2007). However, these results are driven by the majority of youth. In particular in Germany, the many 'smooth' transitions via apprenticeships cover up the patterns of other transitions. Since postsecondary and higher education in Germany is still expanding, knowing about the transition processes into and out of that sub-system gets more and more important.

2.3 Structures of the Educational System and Labor Market Linkages

Young adults who completed the full secondary education and have the highest schooling certificate available in their country have many options regarding their educational career. In principle, returning to (full-time) education after having gained some work experience or interrupting an ongoing education or training course for work is possible at any time. However, the feasibility of entering and returning to the education system depends on both the options and the incentives for additional schooling or for remaining in the labor market without more education. To assess the provisions and regulations by educational systems and labor markets that determine these individual life course decisions, a comparative design is needed. As outlined in chapter 1.2, this analysis as well as the rest of this book will therefore be engaged with comparative research on US, Sweden and Germany.

Several general characteristics of tertiary education as well as flexibility of the labor market need to be described for each of the three cases. I will further develop hypotheses on the country differences of patterns of educational careers and labor market integration of high school graduates in the three comparison countries.

2.3.1 Mode of Stratification

'Parallel stratification' implies a differentiation of educational outcomes by the type of educational program which is chosen out of different parallel educational tracks. Besides parallel stratification, educational systems can be 'sequentially stratified', e.g. into undergraduate and postgraduate studies, or they can comprise both of them. In a classification of higher education systems, Goedegebuure et al. (1993) call systems that comprise both, prestige differences between universities in parallel tracks and a sequential organization of educational decisions, *diversified systems*. The US higher education system is an ideal example for a strongly diversified educational system. Systems which are mainly divided into two tracks with different prestige are called *binary systems* in their classification. A typical example is the German higher education system (before the Bologna reform). As a third category, they refer to

formally unified systems which intentionally reduce status differences by central coordination. Sweden has sometimes been placed into this category (Bauer, 1996). With reforms of the higher education system in 1977 the vocational tracks of higher education (university colleges) were strengthened and made up a rapidly increasing share of the postsecondary education system. Even though these institutions may formally be less clearly distinguishable from the research universities – as e.g. the German *Fachhochschule* – in their vocational orientation and the shorter programs, they play a similar role. Other authors have thus described the Swedish system as one that has developed into a binary system after the 1970´s (Jonsson and Erikson, 2007).

Parallel and sequential stratification are important system characteristics for educational decision making, since their absence or presence changes the consequences, frequency and time of decisions. Under the condition of parallel stratification, decisions about educational achievement become 'one and all' decisions. If a system is parallel stratified and mobility between tracks is impossible, the choice of a track almost perfectly predicts the final educational level. Under sequential stratification, the decision is broken down into steps. Young adults in this system will be faced with smaller but more decisions that are made at different points in time. Hence, as a first hypothesis, I assume that a higher percentage of young adults in systems with sequential stratification split their educational career into several periods of education, intermitted by other activities.

2.3.2 Openness of Educational Systems to Non-Traditional Students

Beyond their basic set-up, education systems differ in their openness to older, non-traditional students. Several policies can foster the late participation in postsecondary education. Higher education institutions can promote flexibility for students who want to re-enter higher education and enable them to combine and arrange education with other life domains (Schuetze and Slowey, 2000). Practically, such flexibility mirrors in less strict regulations, e.g. concerning the number of credits per semester and the schedule of classes or the availability of distance studies. For many young adults, low formal entry requirements are important as well. It goes without saying that in systems were the entrance into the educational system is nearly impossible for non-traditional students that even motivated and able young adults will refrain from enrollment. On the micro-level such policies can reduce students' costs of entry and

changes their behavioral patterns. In some cases - e.g. the one of the Swedish 25/5- or 25/4-rule - policies even remove institutional restrictions completely. Apart from the education system, states can promote access opportunities for non-traditional students by accompanying educational policies with the provision of other institutional support such as studentships. As a second hypothesis, I thus expect that systems which are open for non-traditional students and reduce the costs of late entry lead to more diverse patterns of educational attendance.

For this analysis, I ignore the question on the 'true' aim of these policies. They could be implemented in order to promote equality of opportunities, but also to satisfy the demand by certain interest groups in the elites, so that the equality of opportunity argument is simply used as justification. The latter could be the case e.g. to reduce the cost of unemployed in times of economic downturns by offering enrollment in the hope that the skills acquired by re-entrants guarantee a more productive workforce once the economy reprises. For my central question, whether and how different institutional settings structure the individual educational biography, the true motives of politicians are less relevant. But more should be said about the stability of these institutions once introduced, and also about the question why certain institutions may specialize to cater the needs of non-traditional students. In the following paragraphs, I argue that this institutional characteristic will develop, expand and remain in systems where educational institutions compete for students according to market rules.

2.3.3 Private/Public Mode of Finance and Centralized Control over Higher Education Institutions

Once introduced, I hypothesize, the characteristics of different tertiary educational systems are highly dependent on the *mechanisms of coordination and finance* of higher education. These are either tightly controlled by the state or the free market (Shavit et al., 2007). On the one hand, the mechanisms differ in the extent to which centralized control is operative with regard to the development of the institution and the curriculum. On the other hand, they also differ in the degree to which institutions are free to develop their own profile by catering for consumer demands with specific educational programs. In privately funded market systems colleges have to attract students in order to survive financially. Different suppliers on the market will make differentiated offers specializing on certain clients. Higher education institutions must

offer study programs that meet the demands of students. The strongest example for a market driven system are the United States. Universities are free in the policy they pursue, but also highly dependent on private funding.

In centrally coordinated and state financed systems on the other hand, the state plans the curricula and also finances education. In many state financed systems, including Germany and Sweden, higher education is free or at least subsidized to a much higher degree as for example in the US. In a comprehensive comparative study, Shavit et al. (2007) compare these system characteristics and examine their relation with social inequality. The authors find privately financed systems to be more diverse and to have higher attendance rates in higher education, but also to show higher social inequality within higher education. The core difference between these two types of systems is the main supplier of higher education, i.e. the agent deciding about the offers of higher education. In private systems, the decision about the set-up of the higher education system evolves from a market dynamic. I assume that actors follow the principle of profit maximization. In countries with centrally coordinated higher education systems on the other hand, the set-up of the institutions is a political decision which does not necessarily follow the rule of profit maximization. However, there might be market-like competition if the institutions' fortune (in getting public funding) depends on the number of students it can attract. These systems must thus to some degree be grouped into the market-coordinated systems.

On the side of suppliers of higher education, we can expect that market-coordinated systems force them to offer study programs which are able to attract fee-paying enrollees. Whether they can survive depends on whether there are enough people willing to pay for enrollment in their programs. The competition for such 'customers' should motivate colleges to cater their needs best. If this fails for the majority of potential students, they can focus on certain niches. While high prestige universities will try to attract as talented students as possible in order to maintain their status, lower prestige institutions are under the pressure of finding enough students at all. As these institutions cannot attract students with excellent records, they have to offer other advantages. Such aspects can be open access and easy-to-pass entrance requirements and low tuition fees. More importantly in this context, it could also be a way to cater the demand for non-traditional students, e.g. by flexible class schedules enabling non-traditional students to combine their studies with work and family. Hence, especially lower tier institutions should be motivated to follow a strategy of

'openness and flexibility' and attract young adults who are willing to reenter the educational system. This leads me to the expectation that market systems allow more diversification in the timing and patterns of educational careers than state-coordinated systems.

When education is financed by the state, the question of a flexible organization of studies enabling non-traditional students to enroll becomes a political issue. Colleges can be opened to non-traditional students, e.g. to promote greater equality of opportunities over the life course. But there is no system-inherent mechanism which would cause this. It rather depends on the policy makers and which aims they pursue with education. Therefore, a general claim on the coordinating mechanisms of the education system is much more difficult to make than for countries where private funding plays a pivotal role for the financing of higher education. Consequentially, the strong link between non-traditional students and lower prestige institutions will not necessarily evolve.

As opportunities for flexible educational careers in the market-coordinated framework will only be created upon demand, we can directly expect more diversification in the educational career patterns in systems offering many opportunities for non-traditional students. This effect is fostered by the fact that students can anticipate re-entries a long time before they actually enter the educational systems (see e.g. chapter 4.1 of this volume for evidence that entire sequences of education are often planned ahead).

Gaps can be triggered by students' inability to pay for the costs of education. They can then leave the educational system with the aim to return whenever they were able to amass enough savings to 'cover the next round of college'. When higher education is costly, not only stop-outs/drop-outs can cause diversification of postsecondary education career patterns. Indeed, a number of studies suggest that high work-load or the financial situation can account for drop-outs (for literature reviews see Pascarella and Terenzini, 2005; Riggert et al., 2006). Involuntary drop-outs are likely candidates for re-enrollment once they have gathered enough savings. This pattern then results in interruptions instead of totally drop-outs. But high working hours during college in systems with high costs for higher education could also lead to other deviations, such as delayed graduation or also permanent drop-outs (Weiss and Roksa, 2012).

Summing up, we can expect that opportunities for late entries into higher education will evolve in market-coordinated systems, but can as well be created in state-coordinated systems if politically wanted. The US can certainly be seen as the most typical market-coordinated system. The Swedish system is state regulated and publicly financed, but has a 'soft market component' in that the institutions have discretion on many aspects of their educational programs. At the same time, many obvious policy efforts have been made to invite older students. The German system is the most centralized one. Against this background, I will now discuss hypotheses about the patterns of educational careers in the three comparison countries.

2.3.4 The Institutional Background: the Institutionalization of Educational Careers by the Higher Education System in Germany, the US and Sweden

The German higher education system contrasts strongly with the US system in many respects. Until recently, there was almost no sequential stratification and the system was only parallel stratified into two main tracks with clear prestige differences. Financing and organization of higher education in Germany are duties of the federal states that also tightly control the universities and second tier *Fachhochschulen* (Mayer, 2003). There are almost no specific arrangements in favor of non-traditional students and studies last generally four to five years (see above under 2.3.2). Selectivity of secondary education is strong. Higher education can only be entered with an *Abitur*- or *Fachhochschulreife*-degree, while the latter only grants access to the lower tier *Fachhochschulen.*

The US higher education system is a sequentially stratified system which is at the same time diverse. It opens many opportunities for flexibility in higher education. The sequential stratification manifests in the Bachelor-/Master-structure of degrees and the two year colleges with transfer-classes which enable to continue at regular colleges. But these three 'institutionalized steps' between different programs are by far not the only opportunity to interrupt postsecondary education in the US. Many colleges follow a laissez-faire policy with regard to stop-outs and late (re-) entries.

Compared to European countries, the financing of higher education in the US depends to a large extent on private sources. The system is diversified and institutions are rather independent in their curriculum and in the admission of students. As

discussed above, in such an environment I expect that colleges with lower prestige specialize on those groups who cannot make it for several reasons to the more prestigious institutions. E.g. Community colleges are 'specialized' on the group of students not able to enter a full university after high school. This comprises poor students, students with lower academic abilities but also older students who want to study late or refresh their education and have to combine their studies with other areas of life such as family and work (Cohen and Brawer, 1996). For the system of higher education in the US, the community colleges are of quantitative importance after their constant expansion throughout the last century. In the mid 1990´s, about half of all college freshmen where enrolled in community colleges.

Thus, community colleges as the lower tier institutions in the market-coordinated US system of higher education indeed behave in the predicted way: they seek for clients among those not aspiring higher prestige-colleges for any reason. While this explanation searches the reason for the openness of community colleges in the structural set-up of the system, authors explaining the American higher education system from a historical perspective have argued that the purpose of community colleges is 'empowerment' of disadvantaged groups and non-traditional students (Cohen and Brawer, 1996; Thelin, 2004). As far as the establishment of the colleges is concerned, this might be the case. For the persistence and expansion of the systems, I suggest the consideration of client seeking as an alternative explanation. Several observations support this hypothesis at least for the US context, where education is often seen as a private good for individual social mobility (Labaree, 1997) and the costs for college education has skyrocketed over the last decades (Archibald and Feldmann, 2010). Here, I will not discuss this in more detail and neither test which of these explanations reflects the specific situation in the US or Sweden best. However, it should be kept in mind that even if the initial aim was empowerment, only those institutions who could find enough students are able to survive.

On the other hand, it must be admitted that the process of opening the system for non-traditional students was in all three cases accompanied by a strong rhetoric on the creation of equal opportunities – e.g. for students who were disadvantaged in their early educational career. The German system has picked up on that trend later than the US and the Swedish systems, as a part of the adaption of the Bologna reforms (cf. Chapter 1.4.1). As the first move towards this direction, the US opened colleges with the passing of the GI Bill of Rights in 1944 to create opportunities for soldiers

returning home from war. This decision has changed American colleges. Besides many minorities and working class students also students of older age and with war experience entered the system (Kaestle, 1993; Stulberg and Chen, 2011). Sweden has made a similar move with the educational reforms in the 1970s. With reforms mainly in the secondary school system that were accomplished in the 1950s and 1960s, the Swedish social democratic government made far reaching educational reforms with the explicit aim of decreasing inequality in opportunities (Erikson and Jonsson, 1996b; Halldén, 2008). Erikson and Jonsson further describe the development of the tertiary system as follows:

> 'Tertiary education was reformed in an Education Act from 1977. Short-term tertiary education, mostly vocational, expanded, and training colleges for nurses and comprehensive school teachers were paced under the auspices of the extended university organization …. . Traditional university courses in faculties of Arts and Social Sciences were furthermore 'vocationalized' (not necessarily by a change in contents). Admission rules were changed, so that work-life experience could now be included as a merit for university studies. Tertiary education was decentralized, in order to diminish regional barriers. All in all, the 1977 reform aimed at making university studies less exclusive, and at facilitating the transition to postsecondary education.' (Erikson and Jonsson, 1996b, p. 72)

This illustrates that opening the system for non-traditional students was an integral part of an educational reform aimed at the provision of opportunities leading to equalization in intergeneration inequality. The astonishing similarities to the US system are well summarized in the directly following paragraph:

> 'In sum, one might say that the school system in Sweden was changed from a fairly traditional European system – with early selection, parallel school forms, several selection points, and small, exclusive secondary and tertiary levels – to a system reminiscent of the American one, with mass education at secondary level. However, it has maintained, or even strengthened the focus on vocational schooling …., and the tertiary sector has not been permitted to expand to meet the demand for university education.' (Erikson and Jonsson, 1996b, pp. 72-73)

Most importantly, however, the Swedish reforms as well attempted to use the opening of the higher education system to non-traditional students to create opportunities for certain groups. This was even more pronounced than it might be salient in the summary of Erikson and Jonsson. One central aspect of the reform to equalize access to higher education was the introduction of the 25/5-rule in 1969 (later 25/4-rule).

According to this rule, all young adults of at least 25 years of age or with five or more years of work experience are in principle eligible to higher education, at least to a certain part of the system (Eurydice, 2000a; Werler and Claesson, 2007). Over time, and in particular with further reforms of the higher education system in 1993, this right has been extended to the entire population (Eurydice, 2000a; Werler and Claesson, 2007). Non-traditional students are further offered a large number of opportunities to combine studies with other areas of their life, for example through part-time or distant study programs.

To sum up, the Swedish system is financed by the state and all public institutions are free of charge. Higher education is coordinated to a high degree by the state. However, Swedish higher universities and *högskolan* are much more open towards non-traditional students than other state-coordinated higher education systems such as Germany. Costs of higher education are low, students receive financial support from the state which is not means tested. In line with the general openness for non-traditional students, selectivity into the group which is eligible for higher education is low. In Sweden, higher education is – as well as in the US – set up in a sequentially ordered Bachelor-/Master system.

The appeal that open and flexible education systems seems to have to politicians is illustrated by the outlets of many multinational bodies urging more countries to follow the examples of the US and Sweden (Education Audiovisual and Culture Executive Agency Eurydice, 2012; Organization for economic cooperation and development (OECD), 1996; Organization for economic cooperation and development (OECD), 2004). For a long time Germany´s education did not allow changing tracks from an early phase of the educational career on (Blossfeld, 1990). For higher education, policies of permeability of tracks and shorter cycles could be observed in Germany only lately in the course of the Bologna reforms which were, as policy maker argue, among other aims a strategy for equalizing educational opportunities (see chapter 1.4).

2.3.5 Labor Market Flexibility

Regarding the core dimensions of labor-market structures I assume that labor market flexibility is an important core institutional characteristic. The available routes into employment will set the possibilities for labor-market entrants to get a suitable job –

with or without completed education. Labor market job protection, as opposed to flexibility, further defines individually perceived probabilities of losing the present job and of being able to get a new job after returning to school. In flexible labor markets, employment protection typically is low which allows employers to fire easily, i.e. in a flexible labor market the division between insiders and outsiders of the labor force is less strict (Lindbeck and Snower, 1989). Flexibility both offers incentives to re-enter education in the case of an unsuccessful or unsatisfactory first job and reduces the cost of giving up a job. In sum, I will discuss three reasons why transitions from higher education to work are less ordered in flexible labor markets.

- First, a higher turnover-rate of workers in the labor market facilitates early exits from the educational system justly due to the number of vacancies. Attractive jobs will divert students away from education more often than in labor markets where entrants face high disadvantages in comparison to insiders. As previous research has shown, flexible labor markets do indeed manage to integrate school leavers faster than more regulated systems (Wolbers 2007).
- Second, once a position is reached in a flexible labor market, the value of holding this position is smaller than in inflexible labor markets. As job safety is lower in flexible labor markets, the chance of losing a job is higher (to be said in real world language: one could be fired soon anyhow). Thus, the opportunity costs for leaving the labor market – or at least reducing working hours – are higher in inflexible labor markets.
- Third, re-entry into the labor market after a second period in the education system is easier. Lock-in effects in the educational system can be expected to be shorter, which again reduce the costs and the risk of re-entering the education system.

Besides labor market regulation, a counteracting force to flexibility is the occupational structuring of labor markets (Kerckhoff, 1995; Marsden, 1999; Maurice, Sellier and Silvestre, 1982; Müller and Wolbers, 2003). Occupationally structured labor markets typically go along with educational systems that provide highly occupational specific skills. Educational degrees can be directly or at least closely assigned to occupations. In systems with an internal labor market logic the education system provides more general skills. Careers and job assignments are organized

within companies[5]. In less occupational structured labor markets, entering the labor market is usually easier and depends less on the formal educational credential (De Vreyer et al., 2000; van der Velden and Wolbers, 2003). Research on whether these system differences matter as much for graduates from higher education as for secondary or non-tertiary postsecondary education is rare or even seems absent. Other system characteristics such as the degree of expansion are assumed to have a stronger effect on the labor market integration of higher education graduates (Kim and Kim, 2003). However, opportunities to enter the labor market with or without vocational degree define the set of alternatives to choose from, even for those young adults who eventually enroll in higher education. If there is no chance to enter the labor market without vocational education, the group of re-enrolling students is naturally reduced to those who have already completed a vocational program and entered the labor market on that basis. Above and beyond, college drop-outs should thus be discouraged by a labor market with high occupational closure. Thus, the requirement of vocational (or alternatively higher) educated to enter the labor market makes the decision about education once again a one-and-only decision. Frequent transitions between the labor market and the education system are difficult. The logical consequence is the hypothesis that the number of deviations from the direct way to higher education will be reduced, but those individuals who are off the standard track will have to go an even longer detour through an initial phase of vocational education.

For the three labor markets compared here, the US are the prime example of a flexible labor market. In comparison to both Sweden in the 1980´s and 1990´s and Germany, employment security is lower and job changes occur more often. Chapter 1.3 has compared the labor market flexibility situation between different countries in the discussion of the case selection and confirmed this: according to the OECD employment protection legislation index and other criteria, the US are not only by far the most flexible system within the three countries studied in this book, but also among a larger group of countries including e.g. the UK. This index ranges from 0 (least restrictions) to 6 (most restrictions). If we compare the exemplary values for 1990, Germany range with a value of 3.17 and Sweden with a value of 3.49 on a similar level, while the US are clearly below that with a value of 0.17.

[5] For discussion of the theoretical mechanism behind this connection of labor markets and educational systems see Marsden (1999) or Müller and Gangl (2003a).

With regard to the occupation-education linkage, the German system is usually classified as a typical case for an occupational labor market, while the US system is prototypical for an internal labor market system (Shavit and Müller, 1998). Sweden stands somewhere in between. Vocational education is available, but taught in schools and less often attended as in Germany (Erikson and Jonsson, 1998a).

Against this background, I expect that the US labor market is the context which eases unstandardized, individualized patterns of educational careers most, while Sweden and German should be similar in this respect.

2.3.6 Summary of Hypotheses

Comparing the three education systems, strong differences in the patterns of postsecondary educational careers can be expected. The main hypothesis is in short that sequential stratification of higher education, openness of the educational system for older students, a more flexible and not occupationally structured labor markets will give students more options and incentives to interrupt education, gain work experience and/or (re-)enroll later. And both of these individual actions, interrupting and enrolling late, will then account for less standardized and more individualized educational career patterns in these societies.

Two types of careers will be distinguished: those leading to a degree and those never completed, i.e. drop-out careers. Due to sequential stratification - conditional on being in one of these groups - the openness of higher education institutions for non-traditional students and the lower selectivity in eligibility to higher education, I expect to find greater variability in educational career patterns in the US and Sweden than in Germany. The high costs in the US system, its sequential stratification and the wide availability of educational opportunities for older students as well as the low requirements for entering higher education, lead to expect that the variation of educational career patterns is greatest in the US. Sweden´s education system has many things in common with the US system, but the financing differs and the market pressure on colleges to get as many students as possible may be somewhat lower. Regarding the labor market, the US is the most flexible case as well. Sweden stands closer to Germany in this regard, but has a weaker occupational labor market structure. In Germany, education is very structured and the institutional corset is hard to break through. Only at high cost, especially in terms of time, can educational

careers be individualized. Therefore, the prospected fewer deviating cases in Germany should go along with a stronger deviation from the norm of following the institutionally prescribed track.

Given the similarities between the Swedish and the US education system in the structural set-up, the question will be if the marketization of education and the labor market structures will make the difference, or if the two countries arrive at a similar institutionalization of educational biographies. Since the main interest of this chapter is the overall difference between countries, I will ignore the hypothesis on the within-country differentiation of the education system.

2.4 Data and Methodological Approach: How to Describe Variability in Life Course Patterns?

2.4.1 Data

For this analysis, I use four datasets (see chapter 1.5):

- for Germany the (West-)German Life History Study (GLHS) (Max Planck Institut für Bildungsforschung, 2004) and in addition for the West-German part of the study 'Working and learning in a changing world' (alwa, Arbeit und Leben im Wandel) conducted by the Institute of Employment Research (Antoni et al., 2010) is used. Of the total of 2543 cases of the GLHS, I omit 1769 who did not take exams qualifying them for tertiary education (*Abitur* or *Fachhochschulreife*) for most analyses. The remaining sample contains 774 cases. The alwa dataset contains 1861 respondents with full information on the variables I use and who are qualified to enter higher education and are born in the time between 1960 and 1974.
- For the US I analyze the National Longitudinal Study of Youth 1979 (NLSY79, U.S. Department of Labor, 2008). I selected respondents of the birth cohorts born between 1960 and 1964 only, with complete information until age 34. For most analyses I refer only to cases that have attained either a high-school degree or GED. These criteria apply to a sub-sample of 2045 for my empirical analyses.
- For Sweden I use the Swedish Level of Living Surveys 1990 and 2000 (Levnadsnivåundersökningarna). For the Swedish context it is very difficult to define those young adults who are qualified to enter higher education. For this chapter I follow the approach suggested by Erikson and Jonsson (2007). For a more detailed discussion of eligibility for higher education in Sweden see chapter 1.4.3, where I describe the structure of the education system and chapter 3.2 discussing inequalities throughout different educational thresholds in the life course. After selecting the relevant cohorts (born between 1955 and 1970, but reduced older cohorts when necessary for balancing life course

spans) and limiting the sample to students qualified for higher education, I have an analysis sample of 744 cases.

All of the mentioned datasets qualify for such a comparative study by providing high quality data about life courses of specific cohorts (see chapter 1.5).

2.4.2 Excursus: Describing the Patterns of Educational Careers as Categorical Sequences

Variation in educational career patterns has many different aspects. Capturing all relevant differences between sequences requires reporting several different aspects, leading to a confusingly high number of empirical results. On the other hand, calculating only one composite measure representing many characteristics at once – such as measures of sequence complexity – one might overlook particularities of certain transitions or sections in the life course. Within this trade-off between 'concreteness' and 'generality', a compromise has to balance the need of abstraction and simplification for comparative research with the need for a detailed description of the complex reality within each context. A somewhat closer look may yield additional insights compared to a composite measure combining many different aspects of complexity. In the following, I will give a brief overview on possible methodological approaches and discuss their application on a comparison of educational career patterns and complex school-to-work transitions. Since sequence analyses are not (yet) standard tools of social research, I will also discuss measures I do not use and eventually substantiate the methodological choice I have made. This short excursus into the topic of description and comparison of sequences will also lay the ground for other chapters following later in this volume.

2.4.2.1 Transitions from School to Work as a Multi-State Process

One approach for comparing processes between groups is to define 'key events' and compare the rates of their occurrence. At least two events are useful to characterize for the school-to-work transition: the beginning of that process, i.e. 'first exit from full-time education' and the end of the transition from school to work, i.e. the 'first job after the last time enrolled in education'. The second event is always as late as the first; it is later if there is an intervening period involving any other activity (neither

school nor work)[6]. In order to characterize educational careers and intertwined labor-force experience, the first and last entry into full-time work are useful to delineate and describe the duration of this process. A useful graphical summary of these events are survivor curves for the two events 'first' and 'last transition from education to work' starting at the time of leaving general upper-secondary education (Coleman, 1984). They show the probability of remaining in the group that has not (yet) experienced an event. Hence, survivor curves include also the cases that have not experienced the event until the interview but may do so in the future. Such curves represent quite well the variability of education and labor market sequences on the group- or context-level.

To arrive at a more comprehensive measure – also including events in between the first and the last transition from education to the labor market – one could simply extend the idea above and count the number of transitions from school to work. Also, the number of periods in education without any interruption or the number of transitions into and out of the educational system can help to better understand the way in which educational careers are structured in a given society. Further, for those cases that do have multiple transitions, we would expect the age of re-entry to be higher (that is, in Sweden and the US higher than in Germany). So far, the description has centered on events – and thus more or less ignores the dimension of timing. The way timing influences the event-centered characterization of sequences is limited to the definition of events – by criteria as e.g. the minimum time spend in the labor force before the change between schooling and working is counted as 'labor market entry'.

Overcoming this shortcoming needs more, additional information. Combined with the events outlined above one would ask about the activities between the two transitions into the labor market. Was the time between the two events spent in education, the labor market or other activities? The share of time individuals spend in the labor market can give useful insights.

Under the headline of sequence analyses, more systematic methods for the analysis of complete educational careers have been suggested. These methods allow a much more parsimonious description of educational careers. This comes at the cost of a more global assessment of different educational careers and leads to values that are sometimes hard to interpret. Indeed, in many occasions much simpler measures might

[6] Alternatively the labor market entry can be regarded in a similar way, comparing the 'first entry into the labor market' and the 'last entry into the labor market'.

be preferable. Several approaches to the description of categorical sequences and a measurement of their complexity have been proposed. A more comprehensive discussion of methodological options is found in a recent working paper of Aisenbrey and Fasang (2009). Also, the reference manual of the TraMineR software (Gabadinho et al., 2008) gives a statistical summary in addition to a manual for practical sequence analysis using the free software package 'R'. In the following, I introduce two possible sequence analytical strategies. First, methods describing the complexity of educational career patterns as such and second, methods comparing the sequence of each individual with a theoretically defined 'comparison sequence', the sequence we would find if the ideal and direct road through the educational system is taken.

2.4.2.2 Sequence Complexity and Sequence Turbulence

Similar to counting the number of transitions from school to work, as suggested above, one can describe one aspect of sequence complexity by counting the number of transitions between distinct states occurring in a sequence, i.e. the number of transitions from school to work or back plus one. This measure appeals with simplicity, but still cannot capture any differentiation in the duration of the states. However, we often want to qualify sequence as being more complex which follow transition pattern where the transitions distribute equally over the sequence. The following two sequences illustrate this problem:

Sequence 1: `work-school-w-s-w-w-w-w-w-w-w`
Sequence 2: `work-w-school-s-s-w-w-s-s-s-w-w`

Both sequences are of equal length and contain an equal number of transitions, but the educational career of sequence 2 can intuitively be described as being more 'complex' or less 'stable', since it is harder to predict a certain activity at any point in time. In a more extreme example, a 100 months long sequence with five different states in the first five months and then no change between month five and month 100 should ideally be characterized as being less complex than a sequence with the same number of transitions occurring with a distance of approximately twenty months. This can be solved by reference to a measure for the variation of the length of the different 'activities' or 'states'. Differences in the distribution over time can be characterized by the longitudinal entropy *h* (also Shannon-entropy):

$$h(\pi_1,...,\pi_a) = -\sum_{i=1}^{a} \pi_i \log \pi_i$$

with *a* being the number of different states that are principally possible (i.e. in sequence analysis terminology: the size of the alphabet) and π_i being the proportion of time in the total sequence in which the state occurs. However, now the number of transitions between states is ignored. This is particularly problematic in the case of educational careers, as I only distinguish between two states and the qualification of many different states is not the problem. In this case, the entropy *h* is completely predictable from the amount of time a person attended education (as share of the total time of the observation period). Thus, the two representations of 'event occurrence' and 'timing' closely correspond to the very simple approach presented above.

A more condensed measure should now be able to combine the two elements. Several different suggestions have been made to tackle this problem. None of them has yet neither been justified by a theoretical argument nor proven to be the most useful tool in practice. A rather direct combination of the two measures is the complexity index suggested by Gabadinho et al.(2010)

$$C(x) = \sqrt{\frac{\ell_d(x)}{\ell(x)} \frac{h(x)}{h_{\max}}}$$

where $h_{\max}$ denotes the theoretical maximally possible entropy (which is log a), $\ell_d(x)$ the length of the distinctive state sequence (all transitions between states in the sequence + 1) and $\ell(x)$ the total length of the sequence. The sequence complexity index can take values between 0 (no complexity, consists of only one state) and 1 (maximal possible complexity is reached). It closely corresponds to Pearson´s correlation coefficient r.

An alternative measure is the sequence turbulence – which is in recent publication also called sequence complexity – suggested by Elzinga (2006). This measure is much more computational intensive. In this framework, each of the sequences is divided into different sub-sequences. Sub-sequences are sequence patterns describing parts of the sequence, e.g. the educational career. Consider for example a sequence of `w-s-w`; then `w-s` is a possible sub-sequence. The criterion for complexity of a career is the logarithm to the basis 2 of the number of distinct sub-sequences. The complete educational career is divided into all possible sub-sequences

that are contained in it. The more transitions between activities occur, the more sub-sequences can be found. Beyond that, this measure also captures the number of transitions between two identical activities. If identical activities are 'located' closer to each other in the career, this reduces the number of possible sub-sequences and hence can be used as an alternative representation for the distribution. It is defined as

$$C(x) = \log_2(\varphi(x)\frac{s^2_{t,\max}(x)+1}{s^2_t(x)+1}$$

where $\phi(x)$ denotes the number of sub-sequences in a sequence and s^2_t the variance of the time spent in the distinct states consecutively. The measure itself has been revised somewhat by the author in the meantime (Elzinga, 2010). The logarithm is chosen as a more preferable scale based on a solely practical argument: the size of the numbers produced by the number of sub-sequences would be extremely large (Elzinga, 2010).

None of the measures is justified by a strong theoretical justification. It should however be noted that in many cases Elzinga´s sequence turbulence leads to higher values for very complex sequences. That means the existing complexity is highlighted (or, as one could also say: overstated) more strongly. In tendency, the measures of Elzinga and Gabadinho et al. arrive at similar results. However, often not even the observations in the dataset are ranked to the same positions. The complexity index is certainly more straightforward and much simpler to calculate. Further, some procedures in the calculation of Elzinga´s turbulence approach are justified by computational convenience rather than on theoretical grounds. Eventually, both measures have the same aim: they describe certain characteristics of single sequences. They make different judgments on the importance of either time variability or event occurrence. The more important problem is that they sometimes reveal smallest values for life courses considered as 'odd outliers' by social theory. A small value thus corresponds not always with a 'usual' or 'smooth' transition. For example, a person being in education forever has the least complex sequence, as well as someone who never had any education. In the case of education careers, there exist norms in educational systems for the educational career pathways – and a measure for complex educational careers should ideally mirror the congruence of a career pattern with this norm. Obviously, this norm includes changing states and a specific value for the entropy that is greater than zero. In general though, a rather low number of sub-

sequences would be the consequence of moving through the system in that way. Thus, Elzinga's sequence complexity seems somewhat more valid for the purpose of a comparative description of educational careers. However, ideally we would want to represent the measure for the deviance from the system-imposed, direct educational career – being smallest for complete accordance and largest for complete non-conformity with it. Instead of a description of the educational career itself, I suggest to characterize the variability in educational careers based on a comparison to the 'standard sequence' of the respective education system. This straight career will be termed 'reference sequence' or 'standard pathway'. As should become clear now, the other methods described above do not qualify for comparative research, since the different standard pathways through the education systems lead per se to different complexity of all educational careers in the different country contexts. This is the case for both measures discussed so far. Therefore, I will now turn to alternative tools.

2.4.2.3 Sequence Distances and the Operationalization of Sequence Deviance

As commonly used, sequence analysis starts out by calculating distances between all sequences to each other and builds clusters of different trajectories of e.g. life courses or careers. The same representations for distances between all sequences with each other can also be used to derive distances to a theoretically chosen reference sequence. The educational career that could be seen as a 'straight road' to higher education in a respective society is a meaningful reference sequence for my question. While a great difference from many educational careers can be a good thing if most educational careers are complex, the difference from a quick and straight way to higher education tells how far a given student deviates from the most efficient way to a degree. For the given three educational systems, we can define three reference sequences that can be assumed to be something like a 'royal road' to higher education between the age of 18 and 32:

- Germany: after the graduation from *Abitur* with 19 years of age, five years of studies would lead to a *Diplom* degree. Hence, the ideal way to higher education would be to finish everything after the first six years of our observation-window and then transfer to 'non-studying'.
- United States: after graduation from high-school (in most cases with age 18), a Bachelors degree can be achieved ideally in the first four years. Hence, the

first academic degree can be reached earlier than in Germany. The ideal sequence would be to study for the first four years of our observation-window and then stop. Master studies therefore will be marked as non-studying, because otherwise students studying for a Master degree would be characterized as more distant from the 'direct way to higher education'.

- Sweden: after graduation from *Gymnasieskolan*, higher education degrees could be achieved approximately four years later. Hence, we take a sequence template of studies in the first five years of our observation-window, then work.

Again, a number of measures have been proposed for defining distances between sequences. As in the case of sequence complexity, there are hardly any theoretical arguments that would ease the choice between them. The application-context does not suggest preferring one of them either. Therefore, I chose applying the optimal matching procedure as a simple and fairly well established measure to define distances between all educational careers and the aforementioned reference sequence (Abbott and Tsay, 2000). Here, the sequences are evaluated as more distant, the more 'indel'-procedures (insertion and deletion-procedures) are required in order to convert the pattern of the educational career into the reference sequence. For example, to convert the sequence

`w-s-w`

into the sequence

`w-w-s`

we would insert one `w` to convert into

`w-w-s-w`

and then need one more deletion to arrive at

`w-w-s`.

The total 'cost' of the conversion would be two: one insertion and one deletion. The approach requires defining costs for insertions, deletions or substitutions of elements in a sequence. In the example above, I have just assumed that the cost for each insertion and each deletion is one. In principle, for each different transition from one into another state a specific insertion and deletion cost can be defined. Sometimes, it

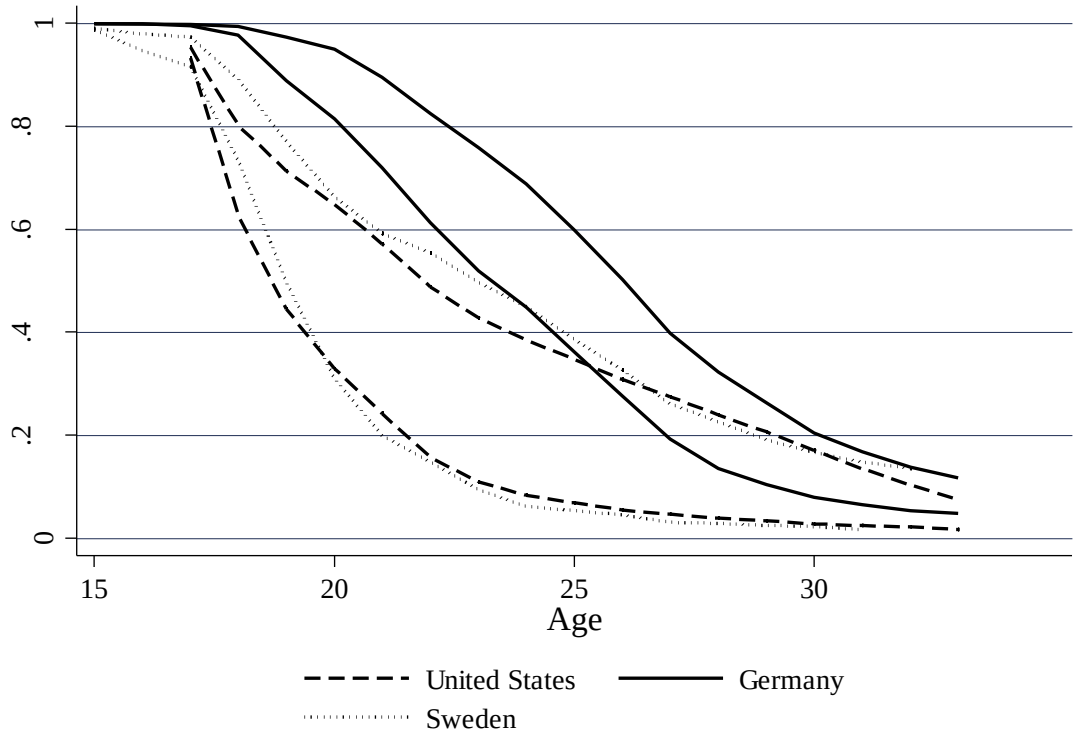
is suggested to derive these costs from the actual transition rates between states in the dataset. However, since the estimation of indel-costs by estimation from the given transition rate can lead to very problematic assumptions and any other indel-cost choice is arbitrary (Elzinga, 2003), I decided to fix the costs for insertion and deletion procedures at the value 1 and for substitutions at 2. It can be shown that in this case, the optimal matching logic is identical with the sequence comparison based on the longest common sub-sequence between two sequences.

In several occasions, substitution costs might be dependent on time and vary over the life course (Lesnard, 2006). When comparing educational careers to ideal sequences of educational careers, it can be argued that time indeed matters for the distances between sequences. The ideal educational career consists for each country of an initial phase of studies and at a certain point in time a single transition into work. In many cases, it might be hard to define a very clear transition point and a variation of few months would in reality not be a deviation with all its consequences. Therefore, a preferable approach could be a procedure assuming an increase in the substitution costs with the time elapsed since the typical transition point from school to work. Transitions near to the typical transition point would then have a smaller substitution cost, and those lying further apart are harder to substitute and hence contribute more to our measure of 'complexity' of educational careers. The weight for a given time elapsed then opens another opportunity for an arbitrary choice. For the following analyses I have compared all results with a set of different solutions for defining indel-costs according to the distance from the expected time-point of the transition from school to work. E.g. by weighting the indel-costs with the log- or square-root of the number of months they deviate from the expected transition month in the reference sequence. Even though this was a time consuming attempt, I will not report the results for several reasons. First, this procedure has not led to any meaningful difference in the results. Second, and more importantly, the expected transition points vary between the countries. As a consequence, the distance that theoretically would be possible thus varies between different countries as well. A solution that produces meaningful results for country comparative research has thus to be left for further research. Albeit the extensive discussion, within this chapter I will only report the results from a sequence comparison based on the optimal matching algorithm comparing each sequence to the reference sequence.

2.5 Results

In the following, I will present several descriptive results on the diversification of educational career patterns. The first approach defines two analytical events: the first entry into the labor market for at least six consecutive months and the last observed transition into the labor market within the time of the life course that is observed in the data – until age 34. Figure 2.5.1 shows these survivor curves for the three societies. These curves show the estimated (conditional) percentage of young adults who have not left education yet for the first time (left curve) resp. who have not left education yet for good (second curve). For example at the age of ~22 in Germany, 50 percent of all young adults qualified to enroll in university have left the education system for the first time whereas in the US and Sweden this has occurred for almost 75 percent at the age of 20. Five years later, at age 25 in the US almost two thirds (64 percent) have left the educational system permanently.

Figure 2.5.1: Survivor curves of first and last transition from school to work in the US, Sweden and Germany.



Note: for each country context, the left curve depicts the first and the right curve the final transition from school to work.
Data source: GLHS 64/71, NLSY79, alwa and LNU; own calculations.

Thus both first and last exit from education in Germany are in general later than in the US or Sweden. Sweden even has a slightly higher rate of late transitions and a higher distance between the first and the last transition, but the pattern overall matches the US pattern almost perfectly[7].

For all three countries, the curve for the first exit is rather steep, which means that many cohort members leave the educational system at the same time. However, the line showing the last exit from the educational system before the age of 34 is steeper for Germany than the one for US students. This indicates that the age at final entry into the labor market is less standardized in the US and Sweden than in Germany. In these more flexible countries there are more very early exits, but there are also more very late transitions and it is hard to determine a typical age for leaving

[7] Note that confidence intervals for the survivor curves can be calculated but were left out of the graph for aesthetic reasons. Sweden and the US are not significantly different when the 95 percent confidence intervals are used as criterion.

the educational system. Sweden even has the lowest slope, showing that this transition occurs most 'individualized' among young adults in this context. The slope of both curves is steepest in Germany, and transitions occur in general later than in the US. The largest difference between the first and the last transition from school to work is found for Sweden. Swedish young adults start their working career early, but apparently re-enter education more often than in Germany and even the US. This pattern also appears when comparing the average time-gap between the first and the last entry into the labor market, which is reported in table 2.5.1. On average the longest time between these events exists in Sweden compared to Germany and the US, and it varies most between individuals. Again the US stands closer to Sweden[8] than to Germany. Hence, in Germany on average the entry into the labor market has more the character of an 'event' than a 'phase' in the biography.

In first row of table 2.5.1, the gap between the first and 'final' entry into the labor market is reported for all cases. The results confirm what we already saw in the plot: in Germany, the disparity between differently defined transitions to the labor market is the smallest, while it is the highest for Sweden. But clearly, the question arises in how far this is a result of

a. the share of those students who enter any postsecondary education at all and

b. the share of students who do indeed enter postsecondary education more than one time.

In order to refine this picture, I report several characteristics of those cases with multiple transitions into the labor market in the second row of table 2.5.1. First, the age of re-entry into education shows that those students who enter the labor market more than once are on average oldest when they return to the educational system in Germany. This is a counterintuitive result at the first view. It is less surprising though if we take into account that there are in general less students in Germany who go that way. For those who are re-entrants when enrolling into the universities, there are several reasons why they are on average even more mature than students in flexible systems of higher education. One reason is the longer phase in upper secondary school and the compulsory military or civil service. Until very recent reforms,

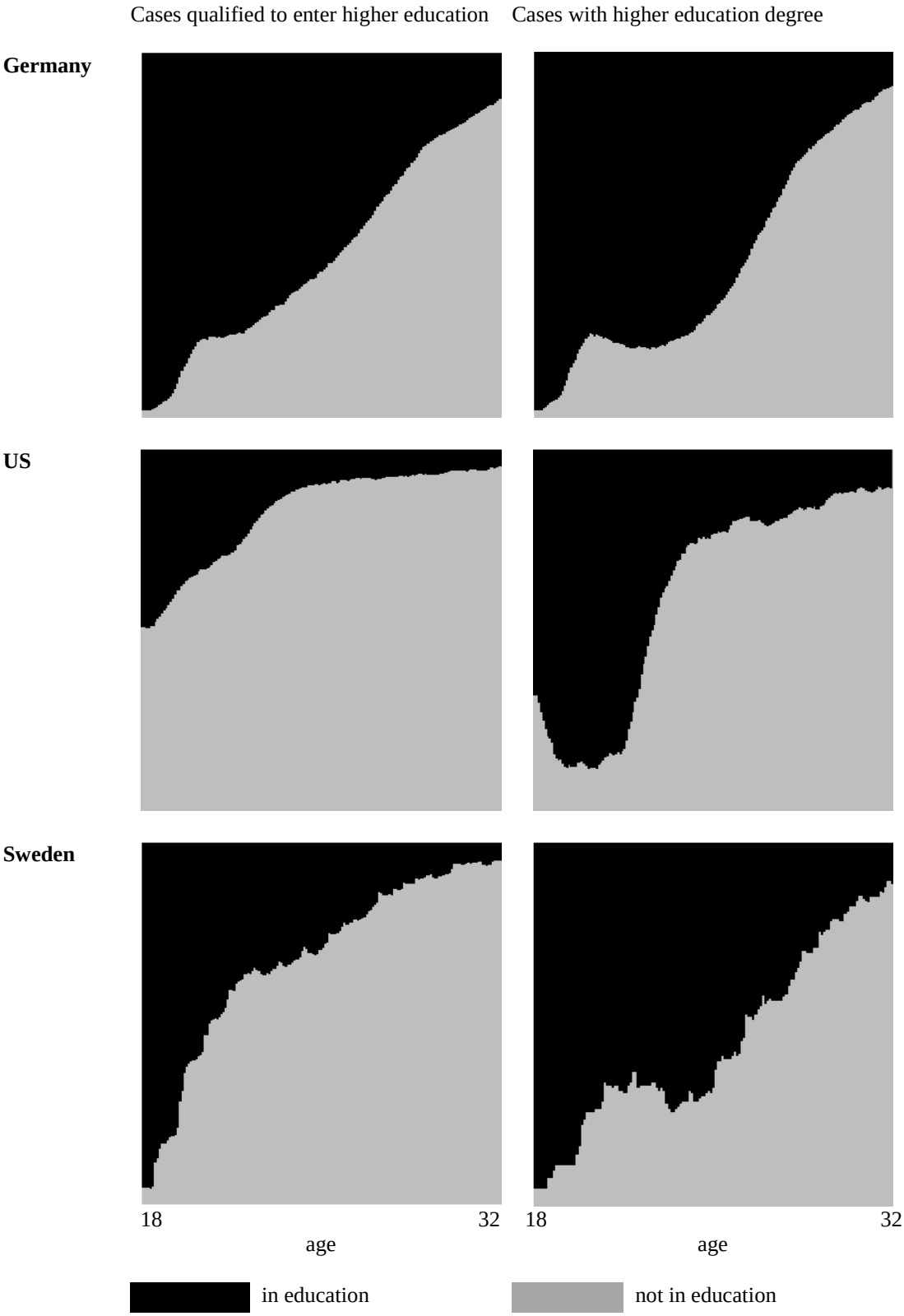
[8] The data is censored after the age of 34 in order to compare it to the German data. If I did not censor at that age, it would become even clearer that more Swedish adults return to higher education very late in comparison with Americans.

schooling which qualifies for higher education lasted in Germany at least thirteen years. Further, most German men in the examined cohorts were drafted for military or civil service, which lasted at least one year. Another reason is the fact that the first entry into the labor market is virtually impossible without obtaining vocational education, which lasts normally two to three years.

Table 2.5.1: Higher education careers: several aspects of variability between individuals.

mean (std. dev.)	***Germany:*** *GLHS*	***Germany:*** *ALWA*	***USA:*** *NLSY*	***Sweden:*** *LNU*
all cases entering the labor market until age 34				
gap between first and last transition from school to work (in months)	30.5 (43.6)	23.4 (40.9)	39.2 (60.4)	38.14 (63.7)
cases with multiple transitions only				
age of re-entry to education	24.1 (3.1)	24.1 (3.3)	22.2 (3.9)	23.6 (3.5)
gap between first and last labor market entry (in months)	71.0 (39.5)	75.4 (44.8)	84.6 (52.3)	92.7 (52.6)
labor force experience (in months) before last labor market entry	26.4 (26.8)	26.7 (27.3)	59.5 (45.2)	59.8 (48.9)
N (not censored)	671	1658	1950	766
N (multiple transitions)	289	685	925	233
N(all cases)	774	1861	2045	744

Figure 2.5.2: Distributions of time spent in education throughout the twenties.



Data source: GLHS 64/71, NLSY79, alwa and LNU; own calculations.

The next two rows in table 2.5.1 confirm that Germans do not spend the time by which they delay entry into higher education in the labor market but in other activities. Those who do delay still have on average a shorter gap between their transitions from school to work, and they collect significantly less labor market experience before their 'final' graduation compared to both flexible systems, Sweden and the US. Again, we see that for Germans the entry into the labor market can be more clearly defined as an event, while Swedish and American young adults start earlier collecting more work experience before entering the labor market the last time.

On the one hand, we can see that more late entries into postsecondary education occur in Sweden and the US, while young Germans follow a more ordered educational career. This picture is however a bit too simple for comparing the situation in the three countries. Figure 2.5.2 changes the perspective and looks at the distribution of educational attendance between the age of 18 and 32. This shows that the respective group of young adults who are qualified for higher education spend a very different amount of time in the educational system in the three societies. The black space in each graph is the share of young adults in education at a given age. What we can easily see in the left column is that German young adults are clearly the ones who spend on average the longest period of time in higher education. In order to illustrate that this is not only the case because the attainment of the qualification for higher education is much more selective in Germany, I also plot the same distribution for those students who achieve a degree in higher education in the right column. Here we can see the difference of attendance in postsecondary education: in the early years, the share of students in education is high in all countries. However, in the US many students move on more quickly into the labor market. The longest, most intense participation in education can be seen in Germany. In the late twenties however, the distributions in the three countries become similar.

So, on the one hand Germans spend more time in education, on the other hand there are more late entries into education in the flexible countries. This suggests that educational participation in Germany is mainly very standardized due to its long duration, while the shorter programs in the flexible countries allow collecting work experience before re-entry. The result seems to reveal a less standardized educational career and with more, but also shorter episodes in education, even in the Swedish education system with its low costs for education and more regulated labor market compared to the US.

In order to include more aspects of the educational sequence pattern, I now refer to the results of the sequence analytical method discussed under 2.4.2.3: each sequence is compared to the 'straight way' to the first possible higher education degree using an optimal matching procedure. That means I count the number of insertions and deletions of monthly observations in order to transfer each of the sequences into this template sequence which represents the 'smoothest way to a degree'. The results are summarized in figure 2.5.3.

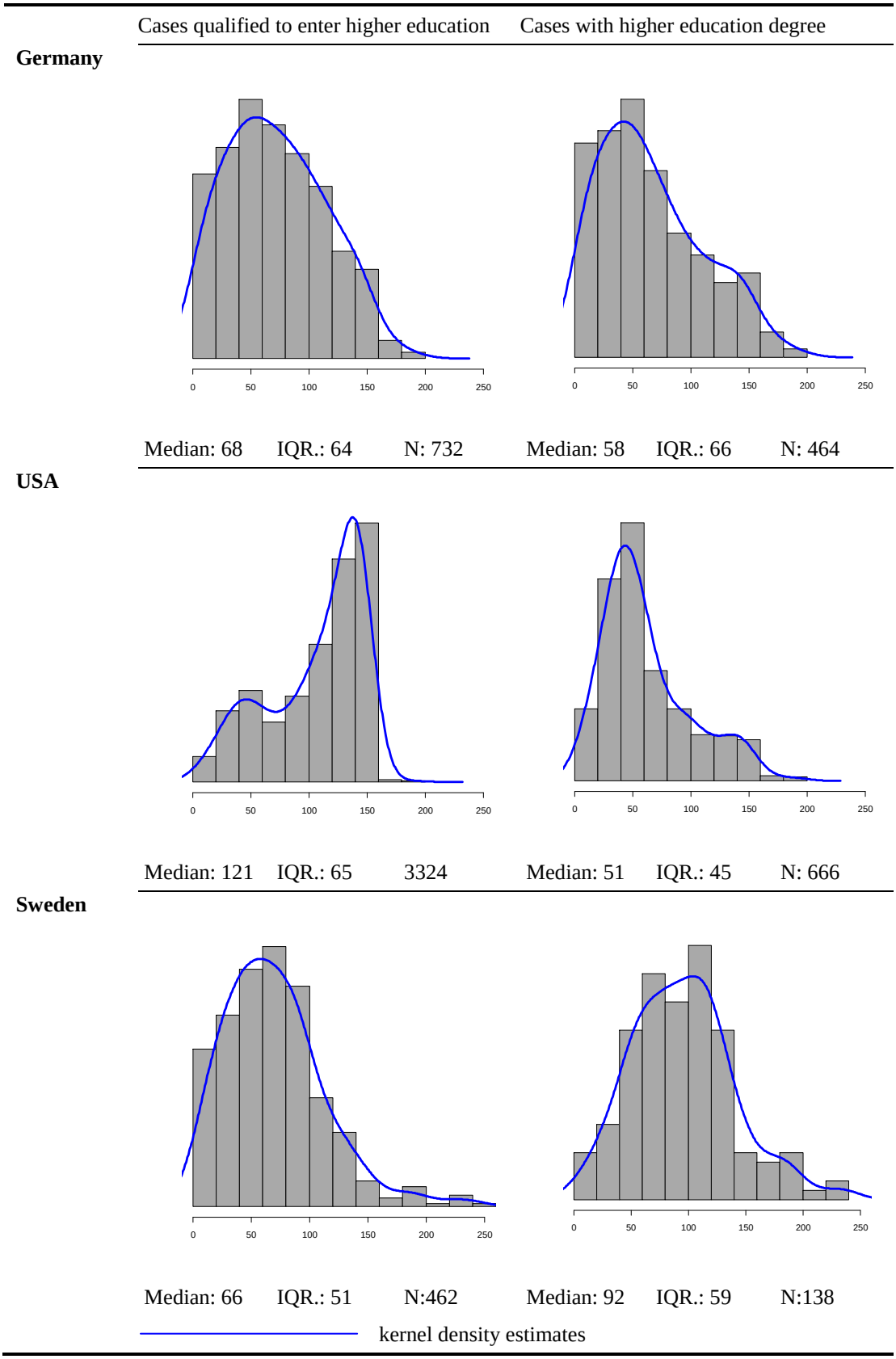
For the sample of young adults who are eligible to enter higher education the German sample contains more careers which are close to the straight pathway to higher education. Among those eligible to higher education, the median-deviation is the same in Sweden and Germany, the Swedish sample however has more 'outliers' at the right end of the distribution, i.e. educational careers being very far from the fastest track than any of the other two countries have. There are many more young adults with great distances to a straight educational career than in the other societies. Combined with the descriptive statistics from chapter 1.4, a likely reason for the strong deviations in the US is the high rate of drop-outs being excluded in the figure on the right. Moreover, qualifying for higher education is less selective in the US, especially when compared to the situation in Germany. Therefore, the typical patterns of studying will be better captured by referring to those respondents who successfully completed higher education only. Now, the US sample has rather low distances to the direct pathway, which are on the level of the findings for Germany. Sweden has the most students with indirect educational career patterns achieving a degree. The highest number of students being very close to the direct track is found for Germany. Germany´s students however also often deviate and the median does not differ from the US. The US even has the lowest share of graduates with very high values on the distance measure. The strong difference for the US according to non-completion or completion of higher education confirms findings from previous research, showing that non-traditional students have extremely low chances for completion (Roksa and Velez, 2012).

In sum, deviations are present in all three societies. In Sweden, non-traditional students succeed in higher education and complete degrees, while in the US those with completed degrees have mostly very direct pathways through the educational system. German young adults have often very small values on the distance measure, but also some cases with rather high values. The latter might be

attributed to the long phases of studies and the high number of young adults completing a vocational degree before enrolling in higher education.

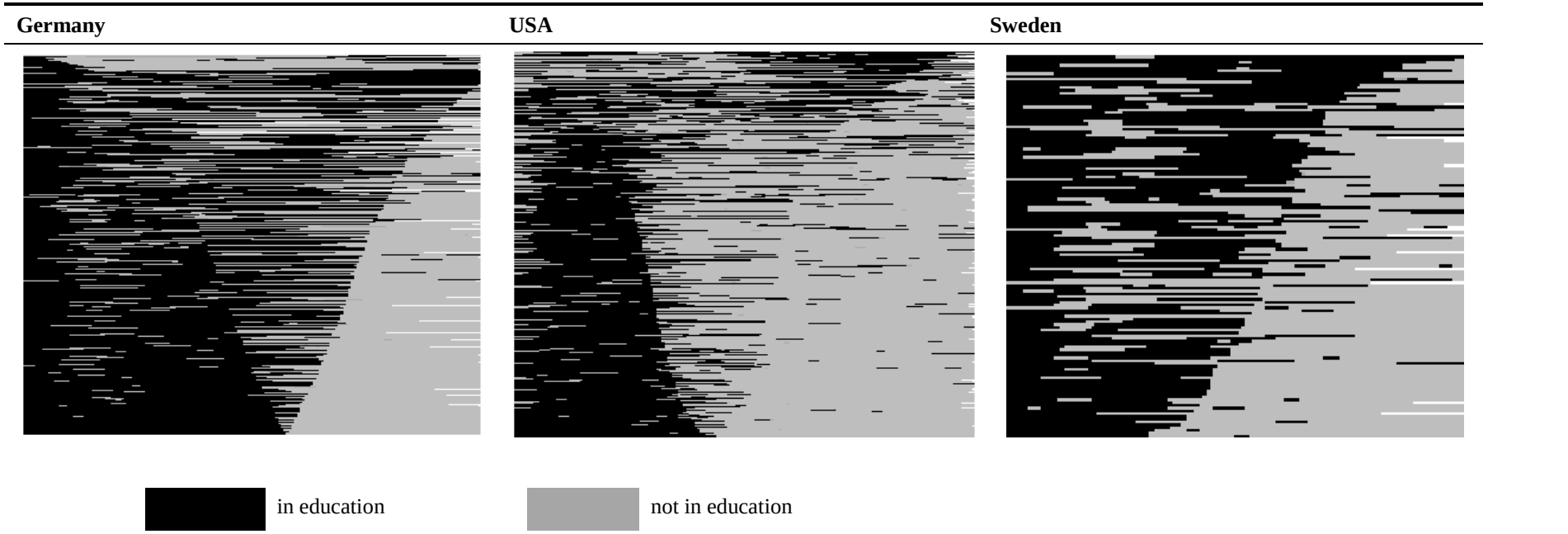
Figure 2.5.4 visualizes the individual patterns of higher education attendance for those who eventually graduate. Each life course is depicted with a line being black when the individual was enrolled in postsecondary education and being grey when the individual was not enrolled. All life courses are sorted according to their distance to the national standard sequence, i.e. the institutional 'prescribed' way to graduation. The figure illustrates the shorter cycles of studies in the US, with frequent interruptions and short stays in the education system, even for those who complete higher education. For Sweden, it is much more difficult to spot any systematic difference to the other two countries. Noticeable is the low number of direct, uninterrupted careers at the bottom of the graph. Thus, even among students who complete higher education in Sweden, those who interrupt are almost the norm.

Figure 2.5.3: Optimal matching distances to direct degree completion.



Data source: GLHS 64/71, NLSY79, alwa and LNU; own calculations. Note on NLSY79 sample: the information needed for this analysis was available for all birth cohorts. The sample therefore deviates from the previous analysis for which the oldest birth cohorts have been dropped.

Figure 2.5.4: Individual pathways to higher education degrees in Germany, the US and Sweden.



Data source: GLHS 64/71, NLSY79, alwa and LNU; own calculations.

2.6 Conclusion

The results of this chapter show that the patterns of postsecondary educational careers are often diversified within societies, and often divert from a normative institutional expectation for straight educational careers. Beyond, however, educational careers and the entry process into the labor force differ strongly between societies. In Germany, were higher education is rather exclusive, higher education careers often follow a straight pattern of studies directly after qualifying for enrollment. In contrast, in the US both the qualification is less exclusive as in Germany and the drop-out rate of those entering higher education is higher. At the same time, many young adults use their eligibility to enter higher education only temporary, enroll later, accept stop-outs from higher education or drop out permanently. Thus, the educational domain accounts for de-standardization and de-institutionalization of the life courses of young Americans. Incompatibility with the model of a direct degree achievement is also common in the Swedish context. The share of permanent drop-outs, however, is to a lower degree coupled with non-standard routes into colleges (cf. figure 1.4.6). While non-standard educational careers are in Sweden as common as in the US, students who deviate from the traditional pattern of educational attendance are much more likely to achieve a full university degree. This finding points towards a more successful integration of students with work experience into the education system in Sweden than in the US.

Overall, in accordance with my first two hypotheses, the two education systems with sequential stratification and openness to older and less flexible students have a lower standardization of educational career patterns. The hypotheses that market coordination stabilizes the systems as diversified and as open to non-traditional students cannot be tested with the present analysis, since I only refer to life-history data from few cohorts. To test this hypothesis on the development of the openness of education systems over time, one would need a time series of cohort datasets. My hypothesis is then that the openness develops fastest in societies in which cohorts entering the postsecondary education system decrease in size. When cohorts become smaller and the number of traditional, regular students decreases,

client-seeking educational institutions will have stronger pressure to win other students. Moreover, as long as the demand for high-skilled employees remains stable, employers will have to recruit more and more among late entrants or upgrade the skills of their present employees, since the supply of regular high skilled graduates decreases. However, this endeavor has to be left for future research.

The German system imposes the longest programs on students for achieving credentials with any worth on the labor market. This is coupled with long and rather continuous attachment to the education system. In comparison to Sweden and the US, even students with interruptions spend most of their time in education, either in higher education or in other postsecondary alternatives. Schooling in years, and thus the cost for schooling but potentially also the skill benefits, is longest in Germany. In Sweden and in the US on the other hand, labor force experience before the last observed transition from education to the labor market is much more common. Postsecondary educational careers therefore are not only less individualized in Germany, they are also more dominated by education. This is, however, not true for those students who achieve higher education degrees at least on the Bachelor-level. For them, studying is the main activity in Sweden and the US as well as in Germany (cf. figure 2.5.2). Apparently, the additional students the US and the Swedish system can include are in general not ‘full higher education’-students, comparable with the German university students. Some of them rather compare to vocational training students. The special feature of the Swedish system is therefore less that educational careers follow less often the national standard pattern, but that even later students manage to complete intensive and long study programs. This finding is worth discussing against the hypothesis that fee-paying systems lead to less standardized educational careers with more gaps. The Swedish students enrolling late often still manage to study long and complete degrees, while this is uncommon in the US. This could indeed be connected to the much higher costs for higher education in the American system. Other reasons would then account for the higher number of later entrants into the Swedish school system, such as the greater flexibility for non-traditional students or the stronger support for students in general. By comparison, the US-students who often have ‘on and off’-educational attendance have higher incentives for education. In the North American context a job does not only guarantee earnings, but also helps to avoid further tuition and other costs of education. However, this conclusion has to be seen as a preliminary one against the background of the much earlier family formation in

the US which could introduce additional difficulties for young Americans to pursue their educational expectations.

Finally, the labor market seems to play a much smaller role than I expected in the hypotheses derived at the outset of the chapter. Educational career patterns of young Swedes have many more similarities with the US system than with the German system. While many characteristics of the Swedish labor market are more similar to the German labor market than to the US, the typical patterns of educational careers seem to be governed much more by the educational system. My hypothesis that in particular non-regulated, flexible labor markets will increase deviations from the standard sequence of educational careers would then have to be refuted.

Against this background, an obvious follow-up question to sociologists is in how far educational inequality is involved. This comprises educational inequality in each of the transitions within educational careers, and in the overall patterns resulting from these decisions. Especially the inequality in later enrollment, after the first labor market entry, is of interest since it is necessary to evaluate whether flexibilization of the education system can indeed contribute to social equity in the higher education system. The next chapter will tackle several facets of this question, comparing again the US, Sweden and Germany.

3 SOCIAL INEQUALITY IN EDUCATIONAL CAREER PATTERNS IN CONTEXT – CLASS EFFECTS ON POSTSECONDARY EDUCATIONAL CAREERS IN SWEDEN, GERMANY AND THE US

This section links the findings of section 2 to educational inequality. Asking what the implications of diversified educational careers for different educational systems are, I discuss in 3.1 some theoretical extensions to section 2 and a number of empirical findings. Comparative analyses in chapter 3.2 differ from section 2 by focusing first on inequality in single transitions within the educational career. I will present multivariate analyses with the aim of a more depth description of each society. A similar type of analyses as in section 2 will follow later in chapter 3.4 discussing the potential of social origin differences in educational career transitions for social origin differences in the overall educational career pattern. I will show how social origin differences between countries found in chapter 3.2 relate to the timing dimension of educational inequality. In chapter 3.3 I discuss in how far the results of 3.2 could be driven by different selective processes in the different countries.

The previous section has documented that postsecondary educational transitions are embedded into life courses differently depending on institutional structures. As a strong and direct link to educational policies and institutions seems to exist, an obvious follow up question is how these differences relate to educational inequality. Under the label of lifelong learning, policy makers often celebrate late entries into postsecondary education as opportunities for individuals who were previously disadvantaged in their educational career (Education Audiovisual and Culture Executive Agency Eurydice, 2012; McLendon, Jones and Rosin; Óhidy, 2009, Ch. 1; Organization for economic cooperation and development (OECD), 1996; Organization for economic cooperation and development (OECD), 2004; Wolter,

2010). Fuelled by the hope that earlier disadvantaged young adults can use second chance education to compensate for earlier disadvantages, proponents of school re-entry opportunities hope that widening the access for non-traditional students will reduce social origin differences in education. Wolter et al. even speak about a 'global policy consensus (John Field cit. in Wolter, Wiesner and Koepernik, 2010)' with regard to the necessity for lifelong learning. It was a core aim of the recent reform of the Bologna system to open the education system for older, non-traditional learners (Education Audiovisual and Culture Executive Agency Eurydice, 2012; Wolter, 2010). The overwhelmingly positive evaluation of the provision of the blurry life-long learning concept has been summarized by Schütze and Slowey (2000) and led them to the somewhat ironic conclusion: 'In making sweeping claims for lifelong learning in terms of providing the solution to a range of economic and social problems, the concept has become something of a 'New Jerusalem' (Rubenson and Schuetze).' (Schuetze and Slowey, 2000, p. 10).

More differentiated views are expressed in the scientific debates around life-long learning in postsecondary education. Several scenarios can counteract the expectation of equalization and thus challenge the claim that societies with more adult education are per se the more equal ones. Although adult education can reduce inequality, it may also increase it (Weedon and Riddell, 2012). Previous studies found evidence that, indeed, inequalities school entry throughout adulthood by social origin exist and lead to a continuous disadvantage of children from the lower classes (e.g. Elman and O'Rand, 2004; Elman and O'Rand, 2007; Goldrick-Rab, 2006; Jacob and Weiss, 2011). Since adults who participate in life-long learning in formal schools often already had more education before, this phenomenon is sometimes referred to as the 'Matthew effect in education' – following Merton´s description of the 'Matthew effect in science' (Merton, 1968). Taking the Matthew-effect hypothesis serious, one has to expect that the creation of additional opportunities for lifelong education would first help those who are already well-educated and from advantaged backgrounds. While it is not difficult to find one of the two hypotheses published in policy reports of scientific work, there are by far not as many studies which discuss the two positions against each other on the basis of empirical evidence. In this section, I will present several different pieces of empirical evidence which can contribute to such a debate.

Along with other changes in the education system, several countries have expanded higher education. An extension of opportunities for older students has been part of the expansion of the tertiary education system as a whole. Educational expansion implies that higher education became less exclusive. Students of educational stratification have connected educational expansion with the development of inequality. When more students achieve higher education, the relative position of the highly educated will be less of a privilege. This process has been studied for a multitude of countries in the last years and concluded that expansion contributed to inclusion of previously disadvantaged groups (Shavit et al., 2007). Then, however, the question arises whether there are new dimensions of social stratification within higher education through which inequality can persist. The link between expansion and new differentiation is even claimed to be a general pattern in the work of Lucas (2001; 2009) on effectively maintained inequality (EMI). In brief, his expectation is that socioeconomically advantaged groups always secure their advantages in educational outcomes. Whenever possible, they do so in a quantitative way, i.e. they manage to get more education for their children. Beyond, they also strive to get 'better' education and achieve a qualitative advantage, a demand that is served by system differentiation. Examples for such qualitative differences in the US are that better schools are often located in richer neighborhoods, or the sorting into different tracks within American high schools. Whenever quantitative differentiation is no longer possible because a certain educational level becomes universal, qualitative differentiation 'steps in' and leads to new inequalities. This framework was influential for subsequent studies of educational inequality. At the same time, many studies not explicitly referring to EMI have shown inequalities in time patterns of educational attendance and stressed their importance for educational inequality in certain contexts, in particular in the US (Carneiro and Heckman, 2003; Coleman, 1984; Goldrick-Rab, 2006; Light, 1996; Milesi, 2010; Roksa, 2011; Roksa and Velez, 2010). This differentiation into different time patterns of attendance in education can be seen as qualitative differentiation as expected by the EMI hypothesis. While achieving the same 'amount' of education, disadvantaged students would have to go the long and winding road, with several consequences. Examples are later degree achievement and therefore lower lifetime returns to education or a higher probability for situations in which education interferes with other life course events, such as family formation or

the necessity to make ones' own living (see section 5 on consequences of interrupted education).

Different scenarios for an increase or decrease of inequality are possible when access to adult education is widened. All of the aspects around the question of inequality in the transitions within educational careers and educational career patterns will be discussed in the next chapters.

- First – what best represents the Matthew-effect – stronger or continuously high levels of inequality by social origin in the entry into education throughout adulthood. In this case, educational inequalities would increase over the life courses of cohorts. The degree of inequality in 'belated' education in the three countries will be subject of chapter 3.2. This chapter will also contextualize inequality in re-entry with the educational inequality at earlier transitions.
- Second, effects of social origin throughout adulthood being persistent but lower than origin difference in earlier transitions. In this case, inequality still exists and adds up to the given inequality in earlier transitions. This scenario is not very different from the first one. On the one hand because inequality is still increased throughout adulthood. On the other hand because the initial degree of inequality can influence the magnitude of later inequality via the selection effect which will be discussed in chapter 3.3 below.
- Third, inequality can be wiped out and social origin differences be no longer existent, or lower classes even catch up to some degree on earlier disadvantages. In this case, overall inequality in the final educational attainment is reduced. However, a new dimension of inequality is introduced. The way of how a certain level of postsecondary education is achieved is now differentiated into more or less direct educational careers. In how far earlier inequalities are indeed reduced depends now on a number of factors which will be discussed in the following chapters. The latter pattern with a higher number of lower-class children arriving at their degree through detours can even exist if upper-class children are the ones who re-enroll more often – depending on the degree of initial inequality. This will be illustrated and discussed in more detail in chapter 3.4.

3.0.1 Defining Social Origin

Social origins can be understood in various ways and generally refers to the social standing of parents. I will define social origins as the class of parents according to their occupational position. Referring to the term ‘class’ as a central concept, I rely on a definition which is often made in large scale quantitative studies of social mobility (Erikson and Goldthorpe, 1992). This approach refers to the actual occupational positions of the parents and not to subjective judgments of class membership. Parental occupations are mapped into different class positions which represent different employment relations and go along with a stable representation of the economic position in a society (Goldthorpe, 2000).

In practice these so-called EGP- (Erikson, Golthorpe, Portocarero-) classes are generated using information on the occupation of the parents, measure in usual occupational classifications such as the ISCO (International Labor Organization), the KldB (Germany) or Census Occupational Classification (United States). Each occupation is then mapped to a class position, in some occasion using additional information such as whether the worker had a supervisory position. Different authors develop coding routines for the mapping of occupational groups to classes (Ganzeboom and Treiman, 1996; Rose and Harrison, 2007). For most of the chapters following from here on I will use simplified versions of the class scheme and collapse several categories. For the present section, only three broad categories remain: the service classes, the intermediate classes and the working classes. Table 3.0.1 shows how the original full version is simplified into this three-class scheme. For those young adults whose parents both had an occupation, I assign the higher class position out of both parents, i.e. I follow the strategy to include the mother’s position that Erikson has called `dominance approach’ (Erikson, 1984).

Table 3.0.1: EGP Class scheme and simplified version.

Full EGP Class Scheme Categories		Simplified Class Version
I	Professionals and managers, higher grade	Service (1)
II	Professionals and managers, lower grade; technicians, higher grade	Service (1)
IIIa	Routine non-manual employees, higher grade	Intermediate (2)
IIIb	Routine non-manual employees, lower grade	Skilled Working (3)
IVabc	Small employers and self-employed workers	*Assigned to other classes according to occupation*
V	Technicians, lower-grade supervisors of manual workers	Intermediate (2)
VI	Skilled manual workers	Skilled Working (3)
VIIa/b	Non-skilled manual workers	Unskilled Working (3)

The stability of class positions and the usefulness of the concept for intergenerational mobility research has been shown by a long tradition of mobility research. Validation studies have further shown that the classes reflect to the theoretical background which presumed to be micro-mechanism of stratification. is indeed captured in the empirical operationalization, such as the EGP or the closely related ESEC class schema (e.g. Bihagen, Nermo and Erikson, 2010; Wirth et al., 2010).

In accordance with the EGP schema I will refer to ‘service class’ instead of ‘upper class’ when talking about the most privileged class positions. In places I also use the terms interchangeably. When using the term ‘lower classes’ I mean non-service classes, i.e. intermediate and working classes.

3.0.2 Observing Social Inequality in Educational Careers: Two Perspectives

A conceptual clarification that is needed before a theoretical discussion on the emergence of social inequality is the assumption about the timing of decision-making for postsecondary education. I ignored this question – which refers to the individual or ‘micro’-level – throughout chapter 2 and focused on the macro-level structures there. For the question of how educational inequalities develop under certain institutional structures, some more conceptual clarification of the decision making on the micro-level seems necessary. The development of social origin effects at different stages of

the educational career has recently got remarkable attention among sociologists. Most of these studies chose single, isolated transitions in the educational system and compare the impact of social origin over a large set of societies. Others have extended this view and have taken a life-course perspective by comparing inequality along the life course over different transitions (Blossfeld and Shavit, 1993; Breen and Jonsson, 2000; Hillmert and Jacob, 2005; Hillmert and Jacob, 2010; Jacob and Tieben, 2009; Mare, 1980). For each of these transitions, a 'risk set' of individuals being potentially subject to make a certain transition is observed. For studying late adult education, the number of transitions throughout the educational career has to be extended. Leaving the education system therefore is not anymore the final step in the educational career, but defines the set of potential re-entrants. Then, the re-entry into education is another transition with its own potential for social inequality ('transition perspective'). Behind this idea, one would assume something like an ad hoc decision to revise earlier educational decisions and return to school. This assumption of myopia of respondents has also provoked critical response: are we indeed modeling (ad-hoc) re-enrollments or intended delays? To be able to build hypothesis on the re-entry behavior this question is important to consider. That 'the logit model of grade transitions implicitly assumes myopia on the part of agents' (Cameron and Heckman, 1998, p. 263) is one of the central critiques of Cameron and Heckman against using continuation rate models for studying inequality in educational careers. However, given that the young adults who re-enroll indeed try to enter the labor market first, myopia might also apply, and most likely will apply to at least a share of the graduates. This chapter assumes that the decision to leave the education system and re-enter, are both ad hoc decisions and independent from the earlier plans – and that the selection mechanisms are introduced by the education systems and thus technically produce a part of the results we are observing.

Alternatively, the pattern 'work – education – work' can be the result of a planned delay of enrollment (Bozick and DeLuca, 2005; Hearn, 1992; Kempner and Kinnick, 1990; Rowan-Kenyon, 2007). From this second perspective, the comparison between re-entrants and those who never re-enroll is rather meaningless because the decision to enroll at all has been made earlier, at the same time as their peers decided to enroll directly after finishing secondary school. The relevant empirical question for inequality research is thus different. One would rather ask if disadvantaged groups

more often interrupt their educational careers (‘gap-perspective’). The result could then be differentiation of education by educational career patterns.

The empirical questions resulting out of this distinction are linked to the scenarios discussed above. Based on different assumptions about timing of educational decisions, each of the different scenarios above is more or less likely. Empirically testing which model approximates best the decision process on the micro-level will be subject of section 4, in particular chapter 4.2. For the moment, the distinction should be kept in mind to inform the development of hypotheses on the macro-level. The next two chapters following from here on will be devoted to the transition-perspective, 3.4 deals with the gap-perspective.

3.1 Explaining Inequality in Higher Education Career Patterns

Chapter 3.1 is devoted to a discussion about the contribution of macro-institutions to inequality. Its aim is to develop hypotheses on the connection between institutional environments and inequality in delayed educational careers, based on explicit assumptions about young adults' choices on the micro-level. Findings show that inequality persist over the life-course into adulthood within those context which allow flexibility and open access into college in adulthood. These, however, are fairly well explained by characteristics which are determined much earlier in the life courses, in particular scholastic performance in the secondary school system.

3.1.1 Educational Career Patterns and Intergenerational Social Mobility: a Short Review of Previous Studies

Delayed entry into postsecondary and higher education is sometimes – mostly under the label of lifelong learning – seen as a second chance for (previously) disadvantaged individuals, e.g. those from lower social origin (Organization for economic cooperation and development (OECD), 1996; Wolter, 2010). As a result, late education can contribute to a reduction in social inequality. It remains, however, an open empirical question whether the implementation of such chances reduce or even foster inequality (Weedon and Riddell, 2012).

The majority of all existing empirical evidence points towards decreasing social inequality throughout young adults' life course. The later an educational transition usually occurs in the life course, the smaller are usually the class differences that are found. However, inequalities still remain to be important in several cases. For the US most studies show that late enrollments are affected by social origin, (Elman and O'Rand, 2004; Elman and O'Rand, 2007; Goldrick-Rab, 2006; Jacob and Weiss, 2011; Milesi, 2010) and at the same time young adults from lower origin have a higher probability of delaying college entry (Carneiro and Heckman, 2003; Roksa et al., 2007). There are only few exceptions to this overall negative evidence for the US, one being the analysis detailed out in chapter 4.5 of this volume (see also Weiss and Scholten, 2012). I show there that among women late entries have the potential of

reducing disadvantages for lower social origin daughters to a small degree. In Germany the most important type of detours is the completion of multiple degrees, i.e. of first completing vocational education and later higher education. This pattern confirms the inequality which is found for most other contexts since the detour via vocational training into college is more often taken by youth from lower social origin. Furthermore, once a vocational program is completed, the decision to transfer into higher education is less often made by working class children than by those from the upper classes (Becker and Hecken, 2008; Jacob, 2004). Results for Sweden are rare, but in principle point towards the same direction: the most disadvantaged groups in initial education loose further ground through lower re-enrollment rates after the age of 30, while the moderately disadvantaged can catch up somewhat (Hällsten, 2010). Thus, the overall evidence is rather pessimistic on the possibilities to reduce inequalities by adult formal education in all of the three contexts.

As shown in section 2, the amount of late participation varies greatly between countries. Hence, comparative studies should ask whether the different policies aiming at increasing participation have different impacts on inequality. The following discussion of hypotheses will refer to the background information on Germany, Sweden and the US in chapter 1.4.

3.1.2 Macro Conditions for Inequality: Educational Careers of Young Adults from Different Social Origins in Different Contexts

Inequality can be moderated in different ways by the macro-structures of a society. The behavior of students on the individual or micro level always depends on their opportunities and restrictions which are to a high degree shaped by the educational system and the labor market. Two important factors in the explanation of educational inequality are the costs for education and expectations to successfully complete an educational program. Hence, it has to be expected that the impact of social origin on educational career patterns varies between institutional contexts too. Probably the most central aspect is the educational system itself which I will discuss first. Beyond that, characteristics of the labor market – which I discuss in second place – may also shape the framework for individual decision making.

As discussed in the previous chapter 2, key institutional aspects – enabling flexible pathways – are manifold, but openness of the educational system seems to be very closely related to educational career patterns in a given society. But how does

flexibility relate to inequality? And beyond that, are there other important factors, such as costs of education or the selectivity of entrance qualifications?

3.1.1.1 The Differentiation of Educational Systems and Inequality in Postsecondary Educational Career Patterns: Flexible and Inflexible Systems

Differentiation in timing of postsecondary education in many respects parallels with differentiation in higher education on other aspects, which have been discussed extensively regarding their potential to create new inequalities in higher education (Alba and Lavin, 1981; Arum, Gamoran and Shavit, 2007; Ayalon et al., 2008). To exemplify, higher education differentiates into institutions with different prestige and into different fields of study (Davies and Guppy, 1997). Timing patterns are another way how differences between college students emerge. While the expansion and differentiation of lower tiers in higher education created new opportunities, they might at the same time divert lower-class children away from the most prestigious institutions and create a new dimension of differentiation within the higher education system. Many previous studies have argued along this line (Becker and Hecken, 2009b; Brint and Karabel, 1989; Müller and Pollak, 2007) – but the chance that expansion improves integration is also acknowledged (Arum, Gamoran and Shavit, 2007). For the differentiation of educational careers by different time patterns, a similar situation can emerge. Although the introduction and expansion of second or late chances create new opportunities, they might only be the second best options, similar to lower tier institutions.

A certain degree of differentiation in timing of education is a pre-condition for inequality in it. There could, nevertheless, be inequality in timing patterns those systems where educational careers are mostly following the norm with only a few deviations. But this would not be a relevant aspect for the overall educational inequality. Moreover, one could guess that the differentiation in these systems is less systematic and the few deviating students have rather idiosyncratic reasons to be off the norm. In inflexible systems, decisions about education become ‘one and all’ decisions. In flexible systems the decision is broken down into steps. Students in this educational system will have to make more decisions, which are smaller in terms of the stake associated with them. As a consequence, conditions for young adults of varying social origin are different.

As briefly discussed in section 2, in privately funded systems those institutions with lower prestige should have a particular strong motivation to attract students with arrangements which allow flexibility. Hence, in how far this process is related to an increase or reduction in inequality needs to be explained by structural differences too. As discussed at the outset of this section, interrupted educational careers can be seen from two perspectives: delayed entry (gap perspective, assuming long-term plans for educational sequences) or re-entry (transition perspective, assuming myopia in educational transitions). The more successful re-entry opportunities act as device for compensation of earlier inequalities, the more inequality in the time patterns of actual educational careers emerge. In order to arrive at hypotheses that are explicit on the micro-level, assumptions on the individual timing of decision-making have to be made. Depending on the assumptions about individual behavior, we have to expect a different moderation of inequality by institutional settings. Against the background of the different assumptions of micro-level decision making, I will discuss how three different institutional characteristics influence inequality in educational career patterns and in belated entry into postsecondary education.

The institutional aspects that I discuss with regard to both of these micro-assumptions are the degree of expansion and selectivity of earlier educational transitions as well as the costs of higher education. Sweden and the US both have a strong differentiation into different time patterns of educational attendance, but their educational systems enable students to follow flexible pathways. Germany is in a strong contrast to these open systems. And yet there is empirical variation in the timing of attendance in higher education, although fewer students follow non-traditional patterns (see section 2). In contrast, the opposite could be expected with respect to the specific nature of educational detours taken in Germany: the empirically most frequent non-standard patterns are participants of vocational training programs before entering higher education. For this group, the difference in the educational career compared to the direct way to higher education is rather large. Their educational careers consist of at least two years of vocational training in addition to higher education, and often also additional time in the labor market. Since this deviation is rather large and more often chosen by lower-class children, inequality in the degree of deviation from the most straightforward educational career could overall be large in Germany, even though driven by a smaller number of cases.

3.1.1.2 Direct Costs of Higher Education

Higher education is in many education systems much more related to direct and opportunity costs as other, earlier educational transitions. Comparing private spending for higher education between countries (OECD, 2000), it can easily be seen that private systems tend to have higher tuition fees; and at the same time the fees vary more between institutions[9]. Direct costs and opportunity costs are suspected to be a major deterrent to participation in higher education of lower-class students in some societies. For the US especially for institutions with high prestige (Davies and Guppy, 1997).

High costs for higher education can influence the timing of entry into postsecondary education by forcing poorer students to delay their enrollment or make stop-outs (DesJardins and McCall, 2010). If young adults cannot finance higher education themselves and credit markets fail at providing financial resources as well, one possible solution for making higher education possible is to amass savings first. Once tuition fees and living expenses can be covered, they re-enter the educational system. The same strategy could solve liquidity problems during postsecondary education. It is to expect that students from lower social origins will more often face financial constraints. As a consequence, inequality in time patters of educational careers will be high in educational systems where costs are high. Then again, at least a part of students who opted against higher education due to financial restrictions will return to the education system later. Thus, high costs would increase inequality both in initial and in delayed entry into postsecondary education. Or the high rate of delaying students leads to a low or reversed inequality in the late enrollments. If delay is a strategy more often used by able and motivated lower-class students they would then be overrepresented among the late entrants. However, this straightforward logic might not grasp the full reality, as it will only occur under certain circumstances:

- Following from the discussion in 3.1.2.1 the educational system has to allow interruptions, stop-outs and other measures increasing the flexibility for young adults. If this is not the case, only those students will eventually return who do not need flexibility. Therefore, in inflexible and costly education systems, costs will trigger inequality in participation rates, but less so in time patterns of participations.

[9] This even applies to public institutions in these countries.

- The costs of education may not exceed reasonable expectations for returns to it in the labor market. In particular when education is very expensive, some young adults might never be able to accumulate enough resources for education, and again inequality in the total participation prevails.
- The labor market must allow earning enough with a degree from secondary education only. Otherwise, the strategy of the delayers would not work out or they would have to acquire vocational certificates before starting to work.

Applying the mechanisms above to the different country contexts, allows mainly for more differentiation between the flexible systems of the US and Sweden. In Germany, flexibility is low and the main option for taking 'detours' are vocational degrees and subsequent higher education. The labor market in the US and Sweden allows entering without a completed vocational degree and young adults, as chapter 2 has shown, frequently do so. The US is the system standing out with highest costs for higher education, while studying is comparatively inexpensive in Sweden. Hence, if the delay mechanism is at work, the strongest inequality has to be expected in the US, accompanied by a catching up of lower-class children through later re-entry.

For the re-entries, the opposite should be expected in the US. The high costs of higher education there can continue to be a deterrent from higher education for lower-class children (cf. Valentine and Darkenwald, 2008). Remaining inequalities in the re-entry phase must be expected to be lower in the European contexts Sweden and Germany. This hypothesis generally applies to both European cases, but it could be that the institutional conditions discussed cannot unfold in Germany due to a lack of openness for non-traditional students and because the long duration of study programs also increases costs.

3.1.1.3 Degree of Selectivity on Earlier Educational Thresholds

On the macro-level, the amount of educational inequality both in entry rates and educational career sequence patterns can depend on the composition of the group qualifying to enter higher education. Educational systems differ to a large extend in the institutionally introduced exclusion of young adults from an entry into postsecondary, but especially higher education. There are systems which exclude a part of the population almost permanently from access to higher education – or

introduce at least high barriers for entry, depending on the type of secondary education. To exemplify, this applies to German young adults without a *Fachhochschulreife*- or *Abitur*-degree.

Referring back to the hypothesis of effectively maintained inequality (Lucas, 2001; Lucas, 2009), one could indeed expect lower inequality within the postsecondary education system where access is more restricted and limited to a smaller group. If higher education is a very distinctive asset on the labor market, not even upper-class students will seek further advantages beyond it. But once higher education becomes more common, passing through it quickly and straight can become a new advantage. Upper-class students can, in expectation of later socioeconomic advantages, use different resources to take the most direct road into the labor market. Then, inequality in time patterns increases when access opportunities to higher education are expanded.

The other important pathway through which the exclusiveness of the postsecondary education sector can affect inequality in late enrollment is the sample selection of possible re-entrants. While selection effects are mostly discussed as a methodological problem for estimating causal effects, the reason for selectivity can be sought in the institutional set-up of the secondary education system (e.g. Holm and Jæger, 2009). Selection into the group which is qualified for higher education depends on the policy of educational institutions and educational policies. Still they can bias certain conclusions, such as counterfactuals on institutional features of certain systems or the comparison of inequality over several transitions of the life course. Therefore, the problem will be discussed in more detail in chapter 3.3.

With regard to flexibility of higher educational careers, I expect more non-standard careers in countries with lower selectivity. First, since the young adults who are qualified for higher education are more homogeneous in their aspirations to achieve it. The choice or selection into higher education takes place at earlier stages of the educational career and hence, fewer students with only a weak motivation to enter higher education are found among those who are eligible. Second, since those young adults who change their interests and develop an aspiration for higher education are not hindered in the realization of their plans. Or in other words, in systems with fewer restrictions in access to higher education, a larger group of ‘potentially non-traditional students’ from lower-class origins is present in the labor market. This also affects social inequality in postsecondary educational career

patterns. Systems with early, rigid and persistent selection for eligibility to higher education shift a large part of the social selectivity to earlier stages of the educational career. Therefore, I expect more differentiation of educational careers in open systems on the macro level. While they might increase the participation of lower-class children in higher education, they can go along with a new dimension of social inequality in postsecondary education, namely the timing pattern of participation in education.

The German system resembles two characteristics which undermine the development of inequality in postsecondary education. On the one hand, flexible arrangements for studies in higher education are very rare and on the other hand, access to higher education is restricted on a small, selective group in comparison to Sweden and the US. This shifts inequality to early stages of the life course and the remaining group of students who qualify for higher education will be already pre-selected and comparatively homogeneous. Higher education is comparatively cheap, but returns can only be expected after the completion of a degree. Moreover, without vocational education it is very uncommon, and presumably also unattractive, to enter the labor market at all. All of these characteristics of the German system suggest that inequality in educational careers is more a question of becoming eligible for higher education or not than a question of the time pattern of students attendance in higher education. The Swedish and the US system on the contrary both follow a policy of broad access to higher education and manifold offers for re-entrants into the system after gathering some work experience. Therefore, I expect to observe more inequality in re-entry in these two cases.

Table 3.1.1: Summary of institutional characteristics of Sweden, Germany and the US that are expected to determine inequality in educational career patterns.

	Germany	Sweden	United States
educational system			
flexibility for non-traditional students: *how common and how difficult or easy are stop outs and re-enrollments*?	low	high	high
selectivity: *what is the share of a cohort who qualifies for higher education?*	high	very low, for delayed entries almost universal	low
direct costs of higher education	low	very low	high
labor market			
chances of labor market entry without any vocational degree	low	medium	good
uncertainty of returns to higher education: *how much do wages differ between individuals with the same educational degree?*	low	low	high
labor market flexibility: strictness of employment protection legislation	high	high	low

3.1.1.4 Structure of the Labor Market

So far, I discussed features of the education systems only. However, labor market opportunities are the major alternative to postsecondary education. As discussed in chapter 1.3.2, the labor markets differ in flexibility and the safety of jobs, which defines the opportunity costs for quitting a job and re-enrolling. And beyond, returns to education on the labor market are presumably the main motivation to attend education. Hence, the structure of the labor market is another institutional factor which can moderate inequality in educational careers. I hypothesize that two aspects of labor market returns will be influential in this context: average returns to education and the predictability of these returns. Further, both of them can be different for secondary education on the one hand and postsecondary education on the other hand. As discussed in chapter 1.3.2, the labor market institutions in Germany, Sweden and the US structure work-related life course events and sequences in different ways. The US labor market can be characterized as less regulated than the two European cases.

3.1.2.5 Deviations and Safety Nets: Total Labor Market Returns for Upper Secondary Education Graduates without Postsecondary Education

In a labor market which offers good opportunities without higher education, more young adults might be deviated from studying. This implies at the same time a larger group of potential re-entrants. This deviation mechanism has been extensively discussed for the rather attractive system of apprenticeship training in Germany. Several authors argue that the attractiveness of apprenticeship training deviates young adults who qualify for higher education away from it, especially those from lower-class background (Becker and Hecken, 2008; Müller and Pollak, 2007). Besides a permanent deviation, vocational training can also be pursued as a safety net before entering higher education for the case of failure (Büchel and Helberger, 1995; Hillmert and Jacob, 2003). Especially young adults with high uncertainty about successfully finishing their studies (i.e. those from lower-classes or who previously had bad grades) should then take a detour to get a fall-back option. When generalizing this idea, we can expect that all labor markets offering good job-opportunities without having completed postsecondary education will distract secondary school graduates away from continuing their educational career. I.e. one would expect deviation for those systems where the higher education wage or job security premium is small due to relatively high labor market outcomes for educational alternatives below the postsecondary or tertiary sector. The argument can be transferred to any point in time of the young adults' biography. It applies to continuation decisions after graduation from secondary school, after completion of a first postsecondary education such as an apprenticeship or A.A.-degree or after dropping from higher education.

The other important characteristic of the labor market for upper secondary graduates is the security of jobs. Re-entering higher education means in many cases losing a job. Even in the case of part time education it might lead to a reduction of effort in the job and to invest it in education instead. If the job that has to be given up is a save position with a long term perspective, the give-up of this job constitutes opportunity costs for higher education. Now, the employment protection legislation as discussed in chapter 1.3.2 comes in again. The security of jobs as warranted by legal regulations under strict employment protection legislation defines how attractive jobs below the labor market segment for the highly educated are for children from different family backgrounds. If the security is high and labor market entries are comparatively difficult, as can be expected under stricter employment protection, the

opportunity costs of giving up an attractive job below the labor market segment of the highly educated is even higher. I hypothesize that under strict employment protection legislation lower class young adults are 'locked-in' into jobs, they hesitate to give up a save position in the labor market for different reasons:

- First, because the risk of failing in higher education or getting a job after graduation is harder to buffer with private resources by their parents; a secure job is a more valuable asset to them as for their upper-class peers.
- Second, due to the relative risk aversion mechanism (discussed in detail in chapter 4.3), the first priority in status attainment is hypothesized to be the maintenance of the parental status. When entering the labor market after secondary education, this is most likely already achieved by children from lower-class backgrounds, but not by upper-class children. Hence, for young adults from the working classes, giving up a secure class position which fulfills the criterion of status maintenance is a higher opportunity cost than giving up an insecure position that might be lost anyhow. For upper-class students on the other hand, the labor market insecurity should matter less, they would in any case try to re-enter education until having achieved the parental status.

Thus, employment protection legislation can expected to amplify the locking-in of young adults with lower class backgrounds once they have found into a relatively attractive labor market position. This will reduce their willingness to re-enroll.

Comparing the three systems again, the German case stands out with a combination of low returns to incomplete education and attractive options to smoothly enter the labor market via vocational training right away and being secured in this position by a comparatively strong employment protection. For the US, the safety-hypothesis is less likely to explain delayed entry into higher education by lower-class youth. As the US labor market also merits incomplete education to some degree, the strategy of a preliminary degree would not be an effective insurance strategy. The two-year college may play a similar role, but offers the option of credit transfer to the full college. Therefore, it can both be the starting point of academic education and serve as a safety net. Working before entering higher education would be less beneficial than for German young adults who complete apprenticeship training.

Furthermore, the gains that can be realized from higher education compared to any other degree are much higher in the US than in any European context including Germany or Sweden (OECD, 2010; Reisel, 2013). In this case the losses in the amount of forgone earnings have to be traded in for the gain in security. For Sweden, there could be similar strategies as in Germany, but presumably safety nets are less attractive for young adults due to the absence of an apprenticeship training which offers both a vocational certificate as insurance and a smooth transition into the labor market. In the Swedish system the vocational training would have to be completed in the schooling system. The strong certification and early integration of the German vocational training system can thus be expected to offer an even safer option.

Obviously, the US stands out with low employment protection and thus young adults should be less strictly 'locked' in the labor market position and return more often. Moreover, the lower-class children should re-enroll more often as their labor market positions cannot warrant them the safety they would prefer. Sweden stands in between these two extreme cases. While there is no apprenticeship training system as in the German case providing a smooth transition into employment, once a job is found employment protection is more similar to Germany than the US. Therefore, when talking about those who already have found a labor market position and ask whether they would potentially re-enroll, I hypothesize that Sweden in the 1990´s had more similarities with Germany than with the US and is therefore to be counted as a less flexible regime from the labor market side.

3.1.2.6 Returns to (Interrupted) Education

Returns to education vary between different labor market settings, not only in the amount but also in the type and the predictability of returns. Assuming individuals' decisions about education are motivated by the rationality of maximizing labor market returns, the possible size of these returns will become important context characteristics for educational decisions. Social origin differences in re-enrollment, I expect, depend on the security of getting the returns. This involves the perceived probability of actually completing higher education, but also the predictability of returns to higher education. When returns to higher education are hard to predict, even if they are high on average, youth from the lower social origins will hesitate more to invest in it. This hypothesis again draws on the relative risk aversion assumption. If

children from lower social origins have achieved the status of their parents, not only the incentive to invest more in education should be reduced, we can also expect that they will become more risk aversive and prioritize the aim of keeping their current status over further upward mobility via additional education. Beyond, as for example Pfeffer (2011) points out, it can also be argued that upper-class children generally act more risky with regard to investment in education. The wealth of upper-class families serves their children as a safety net for risky investments into higher education. Risks going along with higher education can be seen in college drop-out or insecurity of returns to higher education. In the case of a difficult job search process, parents could for example buffer the search period with their wealth and thus increase the reservation wages of the children (cf. Pfeffer, 2011, pp., 4).

In sum, the risk associated with re-entering higher education can be expected to determine educational decision making and its timing. However, from the assumptions made above, different hypotheses can be developed about inequality in postsecondary education careers as a whole. On the one hand, in societies with good predictability of returns, inequality in the decision to delay would be reduced; lower-class children would enter directly more often. Hence, inequality in educational career sequences is lower in societies with high predictability of returns. If there are, on the other hand, other factors which deviate lower-class children away from entering higher education directly, the rate of later re-entries among working class students should be comparatively high and hence their educational careers would differ more from those of young adults with upper-class background. Thus, the mechanism of the predictability of returns to education works in exactly the same way as costs of higher education. Even though comparative research into this issue is rare and mainly refers to German-UK comparisons, the uncertainty of the returns to higher education can be expected to be lowest in Germany. First, since graduation from higher education is comparatively exclusive (Kim and Kim, 2003) and second, for some fields of studies occupational destinations are strongly pre-defined (Leuze, 2010)[10].

Overall, the two institutional areas I have regarded as moderators of inequalities in educational career patterns (gap perspective) and late re-enrollments

[10] Certainly, one can doubt that a direct transfer of the occupational labor market structure of German secondary education can be made to the tertiary sector. However, I will not discuss this issue here in detail since Leuze (2010) as well as Kim and Kim (2003) could show that labor market entry pathways are rather smooth in Germany for graduates from higher education too. The exact mechanisms should be irrelevant for the individually perceived certainty of returns to education.

(transition-perspective) have some contradictions. From a labor market perspective one would expect the German and the Swedish case to be coupled together as low-inequality contexts. With regard to the education system, in particular the selectivity argument, the US and Sweden should have a higher inequality in common, while the German system selects earlier and should not produce additional inequalities through lifelong learning. With regard to educational career patterns, again the Swedish and the US system should be coupled when arguing based on flexibility, while the German and the Swedish system should produce similar levels of equality in the order of educational career patterns if costs are the driving force. In the rest of this section, I will test these hypotheses against each other empirically.

The question of re-entering or interrupting has accompanied the discussion in this chapter until here constantly. The underlying assumptions about how educational decisions are made have far reaching implications for the influence of institutional settings. But moreover, they lead to different empirical questions: interruptions characterize completed educational careers that are otherwise identical, i.e. lead to identical outcomes. Re-enrollment on the other hand is a transition process. Examining such a process requires to follow a group of potential ‘re-enrollers’ (risk set) and to observe who actually returns. Thus, the empirical questions are rather different and will therefore be treated in different chapters. In the following two chapters, I scrutinize on the re-enrollment process; first, on the different transitions until re-enrollment and then – in chapter 3.3 – on the specific question of selection bias. In chapter 3.4, I then turn back to the questions of educational career patterns and interruptions.

3.2 Less and Later? Educational Inequality in a 'Transitions-in-Life-Courses' Perspective

This chapter scrutinizes inequality in transitions in educational careers beyond secondary school in comparative perspective. Event history methods are used to describe the timing and the rate of eligibility for higher education, entry into the labor market and re-entry into postsecondary education. I find that systems which are nominally very open – the US and Sweden – have higher inequalities in re-entries. These class gaps can fairly well be explained by controlling for few characteristics of the secondary school career.

3.2.1 Transitions in Life Courses and Inequality

This chapter turns to the study of social inequality in educational careers through postsecondary education. Among the two perspectives on inequalities in the life course that I have sketched in the introductory chapter of this section, I will first take the perspective of 'transitions through biographies'. The assessment of inequalities in entire sequences of life courses will be saved for chapter 3.4. Studying transitions needs to start at defining a certain group being eligible to pass a transition, conventionally denoted as 'population at risk'. The population at risk is in a certain state, e.g. 'without higher education degree'. As time passes, more and more individuals are absorbed by the transition to a different state, e.g. they do the transition 'graduation' to the state of 'being graduated'. The occurrence of the event 'enrollment' can be influenced by external factors in two ways. On the one hand it can be delayed. On the other hand, the probability that it occurs at all can be reduced. Three transitions are central to characterize inequality in late entries into postsecondary or higher education in a society:

a. becoming eligible for higher education,
b. entering the labor market in spite of using eligibility for higher education and
c. given eligibility and entering the labor market in spite of using it; re-entering postsecondary education later.

The empirical question of this chapter is how the transition patterns through the three relevant transitions are shaped by social origin and how these processes differ between countries. These analyses refer directly to the theoretical hypotheses set out in the previous chapter, which I will discuss again at the end of the chapter.

The analyses are twofold: I will start out comparing inequality in transition rates between the three country cases. Then, I present more elaborate analyses for each country separately. These will allow to better control for possible compositional explanations of the descriptively shown inequality pattern. As far as possible, these models also introduce some analyses of the role of earlier educational stratification and of scholastic performance for later transitions in the life course. After this country-by-country comparison, similarities and differences in the analyses will be discussed. In the appendix 3.2.10, I describe technical details, including checks on alternative specifications of the regression models.

3.2.2 Methodology

The question, 'when' inequality evolves in the biography is not new to stratification research. Sequential logistic regression models (Mare-models) have been widely used to assess these questions (Mare, 1980; Shavit and Blossfeld, 1993). As a tool to describe the factual distribution of origin effects over the educational career, their usefulness can hardly be questioned (Mare, 2011; Tam, 2011). Their problematic nature for counterfactual interpretations of results, in particular for country comparisons, will be discussed in chapter 3.3. However, there is another caveat in these models for studying transitions which can occur continuously over a longer period of time. As a consequence, the timing of the transition event becomes a question of interest as well. Furthermore, the data will typically be right-censored, i.e. the observation period ends before all individuals have made a transition and thus the researcher does not know what will happen after the end of the survey. Among the transitions described here, right censoring is most likely for the re-entry into postsecondary education. In particular since it is known that in some societies, e.g. in Sweden, re-entries beyond the age of 30 do indeed occur (Hällsten, 2010). The processes of becoming eligible, entering the labor market and particularly re-entering postsecondary education are time dependent events which not only vary in the rate of transition in their sequential order, but also in timing. To describe the time

dependence of biographical transition processes in different groups as well as to tackle the issue of right-censoring, 'survivor curves' and 'hazard rates' are useful (Mills, 2004). Survivor curves are a simple descriptive tool which I already used in section 2. They report the probability of having not made the respective transition, e.g. re-enrollment, until a time t. In event history analysis the survivor curve is usually expressed as

$$S(t_{ij}) = \Pr(T_i > t_j).$$

Where the survivor curve $S(t_{ij})$ depicts for each individual i at any time t_j the probability Pr that the individual time of the transition even T_i exceeds t_j. In the terminology of event history analyses the survivor curves describe for the three transitions (a., b. and c. above) how the population (all those individuals who are qualified for the transition) leaves the pool of 'waiting individuals' over time. To sketch the immediate risk of those individuals who remained in the population until t_j to make a transition (or in event history analysis-terms: to die), survivor curves are not very useful. One would have to get an intuition for the slope of the curve and set it in relation to the proportion of those individuals remaining, i.e. the value of survivor rate itself at the specific time t_j. The slope of the survivor rate is its first derivative, the density function f(t). Intuitively, setting the slope of the survivor rate in relation to the survivor rate itself would lead to a more viable measure to capture the development of risk over time and see the momentum of transitions for different groups. This ratio is given by the hazard rate

$$h(t) = \frac{f(t)}{S(t)}.$$

The hazard rate has the unit 1/t, i.e. it is both, informative about the number of failures per a time unit t as well as about the time t that we would have to wait for the next failure at any specific time during the process[11].

[11] It can be written as

$$h(t_{ij}) = \lim_{\Delta t \to 0} \frac{\Pr(t_j + \Delta t > \mathrm{T_i} > t_j \mid T_i > t_j)}{\Delta t}.$$

Hazard rates are the basis for most event history analysis and the multivariate analyses following below will be based on them too. A detailed discussion of regression models for survivor models would exceed the available space. A growing number of textbooks explain the basics of these tools and their interpretation detailed and intuitively (Cleves et al., 2008; Mills, 2011; Singer and Willet, 2003). As first step of the analysis I give a comparative illustration of the bivariate differences, expressed in survivor curves. By simple eyeballing, a lot of aspects of a transition process in a society can be spotted. However, they 'mix' different aspects. The main problem is seeing clear differences in the slope of the function and how it develops over time for different groups. Hazard rates are clearer in that respect as they are the first derivative of survivor curves and hence show the slope at each point on the x-axis only. Therefore, I include plots of hazard rates in addition in Appendix 3.2.10.

Multivariate models are needed to estimate the effects of social origin on the respective transition process net of compositional differences correlated with social origins. The relevant covariates vary between countries and will be discussed below, but ethnic or racial composition and regional disparities are important in all three cases. The models I report in the main body of the text are part of the class of fully parametric survival models which model the hazard rate as a log-logistic distribution in accelerated failure time (AFT) form. In such a model, covariates are modeled as accelerating (or decelerating) the effect of time as a factor on the survival rate. For interpretation it is important to note that coefficients are switched compared to coefficients in the frequently used proportional hazards metric: positive coefficients indicate a delay and negative coefficients an acceleration of event occurrence. The hazard rate is modeled as a log-logistic distribution, which is a rather flexible way of modeling[12], with an additional shape parameter γ that needs to be estimated. These models have several advantages. One advantage is that their interpretation suits better

[12] Thus, the hazard rate is thus defined as

$$h(t) = \frac{\left(\frac{1}{\gamma}\right)\exp\left(\frac{y-x\beta}{\gamma}\right)}{[1+\exp\left(\frac{y-x\beta}{\gamma}\right)]^2};$$

and the respondent survivor rate S

$$S(t) = [1 + \exp\left(\frac{y-x\beta}{\gamma}\right)]^{-1};$$

this closely responds the odds formulation of the semi-parametric Royston-Parmar-models, as from the above follows that

$$OR(x) = e^{\frac{-\beta}{\gamma}}.$$

for modeling timing differences only instead of permanent differences in the transition rate. For the re-enrollment into education, this is not very relevant, since inequality in both the timing and the rate occurs. Another advantage is the relaxation of the proportional hazard assumption of the proportional hazard models, including the Cox-model (Kay and Kinnersley, 2002; Orbe, Ferreira and Núñez-Antón, 2002). This assumption is violated in several occasions with regard to the central independent variable, the parental social class. Although there are alternative strategies to overcome this problem, e.g. the PEPE-approach suggested by Bernardi (2001), parametric modeling is rather parsimonious and allows predictions more easily. Further – and for country comparisons I perceive it as an advantage – the parametric model does not leave the absolute 'risk' of transitions out of sight. The popular Cox proportional hazards model only models the relative risk of the transition (Royston and Lambert, 2011, p. 2ff.). However, these advantages are traded in for another assumption. One has to specify a functional form, for which I choose the log-logistic distribution. Therefore, examining the underlying process and the appropriateness of the shape chosen becomes a very important question for the correctness of the models. In order to evaluate the choice of the log-logistic distribution, I compare the model with different other possible distributions. I have carefully checked each model by comparing it with varying specifications of semi-parametric Royston-Parmar models which allow estimating smooth baseline hazard rates in flexible shape by using cubic splines (Lambert and Royston, 2009; Royston and Parmar, 2002). Though the Royston-Parmar models show much better fit to the data, by and large they arrive at the same results as I present in below. The comparisons including all alternative models are documented in Appendix 3.2.10. In particular the graphical illustration can serve as a rich source for comparing timing processes over different societies. For the main part of the text I chose to report the simpler and more parsimonious AFT-models only.

The multivariate analyses are carried out for each country separately. Due to the different measurement and availability of covariates for the countries 'construct comparability' cannot be assured. The differences in most cases are not merely inconsistencies in measurement but substantial differences of the countries. To exemplify, migration background is a relevant control variable in Sweden, while for the US race is important. Therefore, allowing some specificity of the modeling by country seems necessary for not overlooking relevant aspects. However, there are also

several methodological limitations in some of the country datasets, mainly the limited measurement of scholastic performance in the American and the Swedish datasets. Also the lack of measures for motivations and cognitive abilities in the German and the Swedish datasets are regrettable.

3.2.3 Data

For this analysis I use for Germany the German Life History Study, for the US the NLSY79 and for Sweden the LNU. In contrast to the section 2, I do not analyze the ALWA study since information on the social origin is rather limited in this dataset and difficult to compare to the other data sources. A more detailed description of the three studies and the selection of the initial samples can be found in chapter 1.5. Here, the selection of the sample differs in some aspects, since more covariates are needed for the multivariate analysis. The Swedish sample is identical, due to the low number of missing values. In order to tackle the missing value problem for the other two contexts, the datasets where multiply imputed using chained equations (Royston, 2005; Rubin, 1996). For Germany, this leads to an analysis sample of 2227 cases (761 qualified for higher education; 459 entered the labor market before higher education) of which 237 had at least one imputed value. The US dataset has the highest number of missing values. Out of the sample of 3107 cases (2522 qualified for higher education; 2233 entered the labor market before higher education), only 777 could be used after imputing at least one missing value.

The key variable social background is measured as a simplified version of the EGP class scheme as introduced in 3.0.1 (Erikson, Goldthorpe and Portocarero, 1979; Goldthorpe, 2000). The original version is collapsed into three categories, the service classes (upper and lower salariat), intermediate classes (intermediate upper sales and service occupations, self-employed and supervisors/foremen) and lower classes (lower sales and service occupations and blue collar working classes).

3.2.4 Results

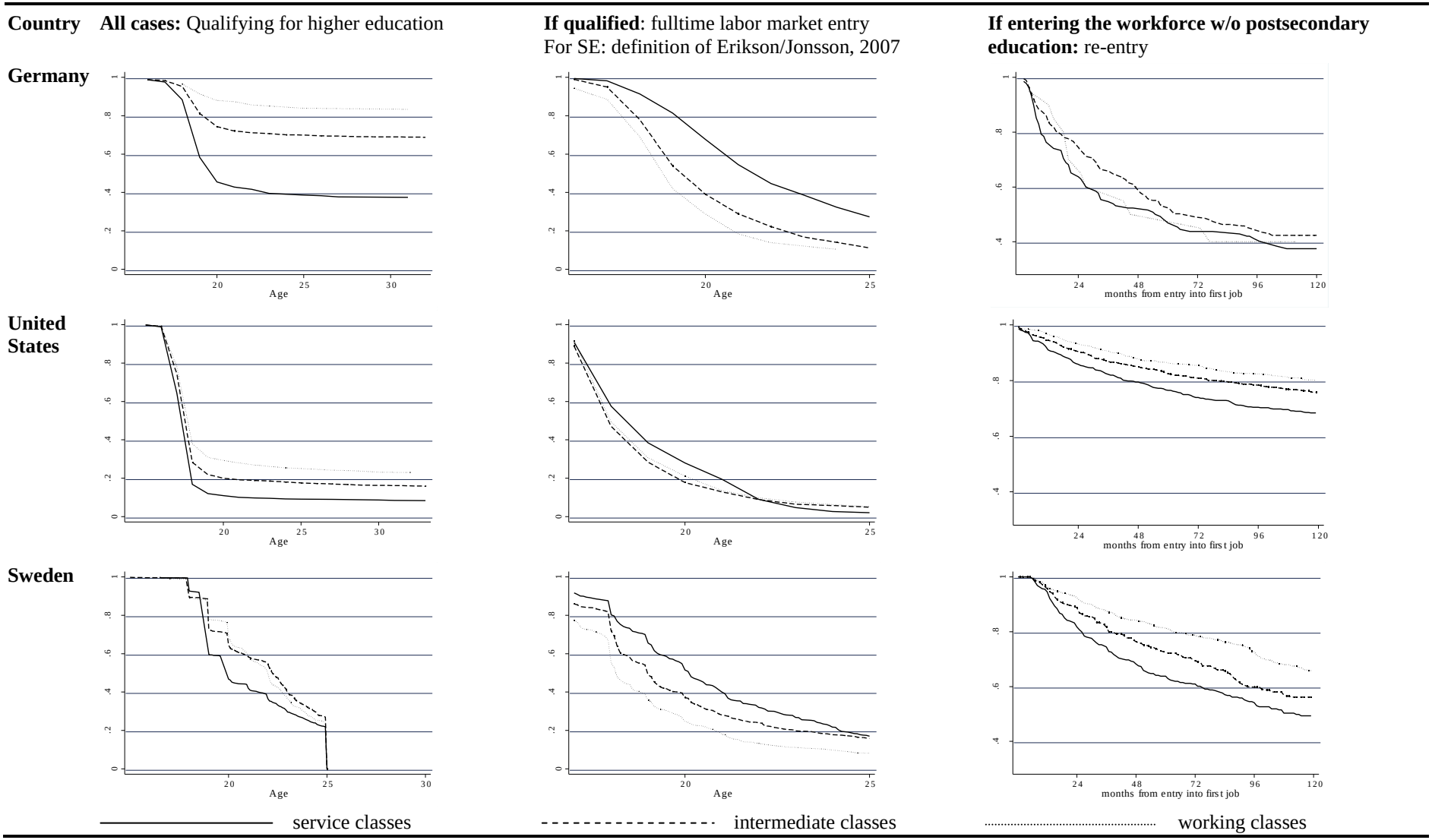
Figure 3.2.1 depicts the process of all three transitions by social origin and for all three societies using survivor curves. While the first two transitions are expressed as survivor curves by age, the duration until the third transition – re-entry into higher

education – is measured in months from the first labor market entry (i.e. months from the second transition).

3.2.5 Inequalities in Qualification to Enter Higher Education

In figure 3.2.1, the first column illustrates the entry-process into the population that is qualified for higher education, i.e. the event of interest is 'becoming eligible for higher education'. Survivor curves by social origin range from age 18 to 30. Without doubt, inequality is strongest in Germany, indicated by the large gaps between the three lines. Children of service class parents are able to achieve eligibility to a much greater extent. Among all social origins, not everybody qualifies immediately at the age of 18 or 19 as the national school systems expects; empirically, there is a number of delayers following later between the age of 20 and 25. Thereafter, the curves turn flat. Hence, while there is only a very small chance of qualifying for entry into higher education beyond the age of 25, many young adults are not 'on time'. They finish their *Abitur* or *Fachhochschulreife* later than age 18 or 19. In the US, many more students get a high school degree, although there is a remaining gap between classes of origin. When looking at the lines closely, it can be seen that this gap reduces slightly over adolescence. For upper-class children, eligibility to higher education is nearly universal. Throughout the 20´s, a low proportion of intermediate and lower-class students catch up (mainly through completion of a GED).

Figure 3.2.1: Survivor curves of school-to-work transition sequences.



Data Source: German Life History Study; Swedish LNU; NLSY79;own calculations.

However, these late-qualifiers do not change the overall pattern much. For Sweden eligibility is defined according to all institutional rules that make students theoretically eligible for higher education. This is possible directly through the completion of respective a secondary school (cf. Chapter 1.4), but also (in principle) according to the 25/4-rule allowing entry into higher education after completion of four years of fulltime work or after reaching the age of 25. The graph includes all cases that are qualified theoretically by any existing rule and therefore shows universal qualification at the age of 25. However, this is an overestimate and the definition of Jonsson and Erikson (2007), which is closer at the 'de facto' qualification for higher education, would lead to a higher degree of inequality. Further, the graph illustrates the consequence of this rule for the timing of achievement of qualification for higher education: the total rate of becoming eligible is the same, but children from upper-class families are more often able to do so faster via the secondary education system. Probably, the theoretical qualification according to the 25/4-rule is a rather limited representation of eligibility, as there are strong differences between different ways of eligibility. Not only is the completion of the *Teorigymnasium* the fastest way with the least additional barriers into higher education, it can also be assumed that the academic preparation of the students for their studies is better. Therefore, eligibility to higher education can follow different definitions and is hard to capture in one event. Since this graph has the purpose of showing the proportion of permanently excluded students, this definition seems useful, but other definitions have to be used in other occasions.

Country differences in inequality concerning eligibility to higher education exist and lead to differences between the populations being able to go through the later transitions. The graphs also indicate that inequality in timing of qualifying for higher education is small compared to the differences in the overall entry probability. As a consequence, initial inequalities are preserved over time. Neither are there substantial reductions in the inequalities by catching up, nor are they increased by continuing disadvantages of lower-class students. There are some exceptions which are often linked to a presumably low preparedness for higher education, e.g. the 25/4-rule in Sweden or the GED in the US. In the case of GED´s for example, the schooling requirements for eligibility to enroll are lower than for high school diplomas (Cameron and Heckman, 1993).

To sum up, both Sweden and the US have lower inequality-levels at the point of qualification for higher education compared to Germany. Early inequalities, however, are only corrected to a very small degree. Further, one should keep in mind that nominal eligibility is often linked to low schooling requirements, such as for GED's or entrants according the 25/4-rule. The catching up in terms of nominal qualification of lower classes is thus probably an overestimate of the de-facto catching up in being prepared for higher education.

3.2.6 Inequalities in the Timing of Entering the Labor Market

Among those young adults qualified for higher education many start to work full time instead of continuing education. Some do so immediately after secondary school, others drop out from higher education. The survivor curves in the second column of figure 3.2.1 show the timing and rate of the labor market entry for young adults who could enter higher education. Shown is only the time between age 16 and age 25. The time patterns as well as the total entry rates differ again both by class and society. The figures illustrate that in all societies a higher share of lower-class students enter the labor market fast, instead of getting (some) higher education before starting to work. But strong patterns of class inequality only exist in Germany and Sweden[13]. There, lower-class students enter the labor market faster. Their entry rate is especially high before the age of 20. This pattern is much less pronounced for the US. In contrast to the European countries, especially Germany, the share of upper-class students staying in the education system without starting to work at all is much lower in the US. Here, the upper classes are even more likely to enter the labor market before 25, which is probably a result of the comparatively short study programs.

Overall, the timing of the transition to the labor market depends on class of origin too. In Germany and Sweden, children from higher social origins are able to stay away from the labor market and invest into other activities – often into education. Lower-class children enter the labor market faster even though the sample is restricted to those who are (nominally) eligible to study. The main difference to the US is that even the upper classes enter the labor market at very high rates in the early 20's and catch up with the lower classes much faster. This reflects the high rate of early labor

[13] Note that for Sweden the population at risk is now limited to those students who are eligible directly through their secondary education. The definition follows Erikson and Jonsson (2007) and deviates from the survivor curve on 'qualifying for higher education' in the very left column of figure 3.2.1.

market attachment among young Americans. For the population of re-entrants this means a more homogeneous composition in terms of social origins in the US (at given overall distribution of origin in the country) than in Sweden and Germany. A caveat for the comparison to European countries lies in the fact that the curves say nothing on the duration of work and how much it may conflict with higher education – inequality might be hidden behind other aspects such as the quality of work (cf. Weiss and Roksa, 2012).

3.2.7 Inequalities in the Re-Entry to Higher Education

The third column shows survivor curves for the re-enrollment into postsecondary education by social class origin. Starting point is the entry into the labor market for those who enter before completing higher education (for at least six month and without studying parallel to their work). The gap between the curves describes differences in the entry rate into education by parental class for the population selected in the processes describe in the first two columns. The figures visualize a clear country pattern: inequality in Sweden and the US is higher than in Germany, where the highest share of young adults re-enrolls; the differences by class of origin are even stronger in the Swedish education system than in the US. What the curves show as well is a strong tendency to enter postsecondary education in Germany, compared to the lower rates that we observe for Sweden and in particular for the US. This pattern mirrors the difficulty to enter the labor market without any vocational education, either vocational training or higher education, in Germany. Somewhat more puzzling are the social origin differences in the entry rates between the systems.

The graphs show that, beyond the inequality in earlier transitions, inequality in re-enrollment still exists. The effects of parental social origins on participation in education last on and reach into adulthood. This is noteworthy, as young adults become more and more independent from their parents. Further, the effects are stronger in Sweden and also in the US, where inequality in early educational transitions is lower than in Germany. It seems that these countries to some degree delay social origin differences rather than eradicate them. It is also interesting to note that there is no catching up of previously disadvantaged groups. In none of the systems can students with lower social origin use second chance enrollment to a higher degree than their peers who grew up in higher class households. If this would

be the case, the service classes would have to have lower re-enrollment rates than the working classes. Furthermore, the hazard rates plotted in the Appendix to this chapter show that the catching up does not occur over time.

Inequality patterns in rates differ between countries remarkably. The difference lies to some degree in the role of the labor market entry. In all contexts, but to a much greater extend in Germany, upper-class children stay away somewhat longer from work and commit to education. Labor market entries in the US and Sweden occur in a more 'casual' manner, and are more often preliminary. In these two systems, where the higher education system has been opened by broadening the nominal qualification for a larger group, I observe more inequality in late entries. Inequality in the timing of labor market entrance is notably high in Germany, where labor market entries without a vocational degree are presumably difficult and go along with disadvantages. Re-entries into some kind of postsecondary education are therefore almost universal in Germany, and no inequalities could be observed.

The survivor curves offer many insights both with regard to timing as well as with the rate differences in event occurrence for the different classes. However, such a graphical description misses systematic comparison in many respects. First and above all, the survivor curves say nothing about the immediate rate of event occurrence at each point in time – the hazard rates. To get an idea about the hazard, the slope of the survivor curve would have to be eyeballed and set into context of the number of those who already transferred. Thus, plotting the hazard rates would yield additional information on the processes for each country. Second, even though statistical tests for the differences between survivor curves are possible, inference statistics on specific class differences are missing. And third, multivariate modeling would allow to account for other compositional differences between children from different classes of origin and to control for mechanisms possibly explaining the class differences. As some of the mechanisms are country specific, I will estimate regression models by country, and thereafter compare the results.

3.2.8 Inequalities in Transitions – Regression Results

Beyond this background of different transition patterns by class, the question arises how to model these transitions in multivariate models. A large number of regression models for time processes can be used for this purpose. By using semi-parametric Royston-Parmar models and graphs of actual hazard rates, Appendix 3.2.10 shows step by step for each country how log-logistic parametric accelerated failure time models are able to capture the shapes of the time patterns. Such a step by step set-up of the models seems necessary to be able to trace the process within each country detailed enough for a comparison between them. As the AFT-models capture the country-specific transitions well, only those will be presented on the following pages as a country-wise analysis of the effect of social class background on each transition. The main focus lies on the re-entry into postsecondary education.

3.2.8.1 Germany

The graphical description of all three transitions shows that the German system filters out early and there is no inequality left in the question of re-enrollment. Multivariate results shall now strengthen or refute this finding. In a first model, I keep compositional variables constant which might vary between classes and at the same time might predict re-enrollment. These are the federal states – as federal states vary in their social composition – the rates of young adults qualified for higher education, labor market chances and the rates of immediate enrollment into higher education. Further, the number of siblings and the sex of the respondent as well as the birth cohort are included into the model. The number of siblings can be correlated with social origin and at the same time determine parents ability to finance higher education. Sex and birth cohort can be unequally distributed by class after qualification for higher education, if e.g. among the lower classes typically men qualify. These compositional variables are kept constant in the first series of models, presented within the columns ‘a.’ in table 3.2.1. Model b. further includes the grade point average of the school-leaving certificates from secondary school. After controlling for this performance measure, the remaining effect would be what Boudon has defined as the ‘secondary effect’ of educational inequality (Boudon, 1974), i.e. effects of social origins that are not mediated by lower performance of working class children. The net effects after controlling for the GPA are of interest for another

reason: selection into higher education is in most cases caused by this score. For some programs, a low score can be compensated by waiting time until enrolment. Then, upper-class children with low performance could wait and later re-enroll instead of entering immediately a different program with lower restrictions in access. Thus, class effects would only become visible after controlling for performance as a suppressor-variable. A further important question is whether students qualify for all higher education institutions, i.e. achieve an *Abitur*, or whether only the lower tier can be entered, which is included as an additional performance measure in model b. in the last row of table 3.2.1.

The results confirm the pattern of the graphical description using survivor curves throughout: inequality is found to be high in early transitions, but not in the later transition of re-enrollment. For this last transition, the class coefficient is only negative for the working classes and not statistically significant at all. Controlling for performance does not change class effects at all. It seems that the fact that re-enrollment is universal among upper secondary graduates who enter the labor market without a degree removes class difference in re-enrollment[14]. Class effects on earlier transitions are strong, on the qualification for higher education as well as on a fast full-time labor market entry.

[14] Then, the question arises whether the inequality does instead occur regarding other criteria, such as the type of institution into which children from different classes enroll. Additional analyses which are not shown here have shown that lower class children indeed tend to choose lower, more practical tracks for re-enrollment. They are more likely to enter apprenticeship training or the Fachhochschule, while upper class children are more likely to enter full research universities.

Table 3.2.1: Parametric accelerated failure time regression: qualification for higher education, labor market entry and re-enrollment: Germany.

	all cases: Abitur or FHR	**if Abitur or FHR:** entering the labor market before higher education		**if in the labor market:** re-entering postsecondary education	
	a.	a.	b.	a.	b.
parents class (ref.: service classes)					
- intermediated classes	0.40***	-0.07***	-0.06***	0.52	0.51
	(11.83)	(-5.78)	(-5.50)	(1.81)	(1.77)
- working classes	0.66***	-0.04	-0.02	-0.43	-0.43
	(10.98)	(-1.5)	(-0.90)	(-0.76)	(-0.79)
male	-0.06*	0.05***	0.06***	-0.84*	-0.96**
	(-2.05)	(4.64)	(5.50)	(-2.98)	(-3.37)
Abitur or FHR-GPA			-0.03**		0.32
			(-3.05)		(1.23)
Abitur (ref.: FHR)			0.12***		-1.11*
			(6.26)		(-2.24)
constant	3.36***	3.20***	3.10***	4.68***	5.64***
	(37.77)	(93.00)	(85.33)	(6.51)	(6.72)
ln γ	-1.08	-2.43***	-2.48***	0.35***	0.34***
	(-34.25)	(-80.96)	(-81.58)	(5.47)	(5.26)
N	2227	761		459	

standard errors in parentheses , * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; FHR: Fachhochschulreife.
Further compositional covariates, not shown in the output: birth cohort, number of siblings (dummy variables), state of *Abitur* or *Fachhochschulreife*.
a. compositional covariates kept constant
b. compositional covariates and scholastic performance kept constant
Data source: German Life History Study 64/71; own calculations.

3.2.8.2 Sweden

For Sweden, I keep a similar set of compositional covariates constant as for Germany: the birth cohort and the size of the municipality approximate the availability of options for higher education; the number of siblings, sex and whether the respondent was born in Sweden are additional covariates. These covariates are likely to be correlated with earlier transitions into the relevant sub-sample of possible re-entrants.

Table 3.2.2: Parametric accelerated failure time regression: qualification for higher education, labor market entry and re-enrollment: Sweden.

	all cases: qualifying for higher ed. by secondary ed.	**if qualified by sec. ed.:** entering the labor market before higher education		**if in the labor market before completing HE:** re-entering postsecondary education	
	a.	a.	b.	a.	b.
parents class (ref.: service classes)					
- intermediated classes	0.44*** (5.45)	-0.03* (-2.42)	-0.01 (-0.82)	0.30 (1.75)	0.14 (0.69)
- working classes	0.67*** (8.49)	-0.08*** (-7.11)	-0.05*** (-4.63)	0.55*** (3.45)	0.33* (1.96)
Male	0.09 (1.44)	0.02* (2.07)	0.02 (1.83)	0.88*** (6.58)	0.88*** (6.64)
born outside of SE	1.48*** (7.81)	0.07* (2.27)	0.05 (1.72)	0.48 (1.51)	0.36 (1.11)
full qualification for higher education			0.09*** (10.07)		-0.71*** (-4.51)
Constant	1.21*** (7.48)	3.02*** (138.84)	2.94*** (137.62)	5.23*** (15.14)	5.62*** (15.87)
ln γ	-0.42*** (-13.69)	-2.64*** (-85.58)	-2.71*** (-87.19)	0.32*** (9.57)	0.31*** (9.28)
N	1822	765		1622	

t statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Further compositional covariates, not shown in the output: birth cohort, number of siblings (dummy variables), size of community of the birth place.
a. compositional covariates kept constant
b. compositional covariates and scholastic performance kept constant
Data source: LNU 1990 and 2000; own calculations.

Now, qualification for higher education is no longer defined in virtue of the 25/4-rule as above. Rather, only directly qualified young adults according to the definition of Erikson and Jonsson are considered being 'qualified for higher education'. In table 3.2.2 the coefficients of the AFT-models show that there is class inequality in all three transitions in Sweden. Upper-class children have a higher rate of qualifying for higher education early, of staying away from the labor market for a longer time and they have a higher rate of re-enrollment if they enter the labor market before achieving a higher education degree. The flexible parametric models in Appendix 3.2.10 show that this class effect is only there for the first four years after entering the labor

market. For the later enrollments, which are comparatively frequent in Sweden, social class origin seems to matter much less.

Holding compositional variables constant, does not change the conclusion derived from the descriptive survivor curves: in Sweden, inequality is distributed over all of the three transitions – even though none of the coefficient for the intermediate classes is statistically significant for each transition. Inequality is carried through even by those who re-enter education at a later time in their life course. Comparing the median survival time and certain survival probability for an ideal case, illustrates how the model coefficients translate into individual differences in the re-entry into education by class. A young male adult born between 1955 and 1957 within Sweden and growing up in a large city without siblings has a predicted probability for not being back in school of 0.64 after five years for service class origins, 0.68 for intermediate class origins and 0.71 for working class origins. Hence, a minority is expected to re-enroll, but class still makes a substantive difference.

Indicators of scholastic performance are not included in the LNU. However, a major dimension of performance with regard to access to higher education is available: the type of qualification for higher education which had consequences for the type of institution that could be accessed. As discussed before, defining eligibility for higher education is rather difficult for Sweden. The most direct way is through the *Teoriegymniasium*, the higher general education track in the secondary education system in Sweden. Alternatively, other ways such as the vocational tracks or the Komvux-System with less intensive theoretical schooling lead to restricted access. In model b. in table 3.2.2 the variable, whether eligibility for higher education is achieved through general upper secondary education, is introduced into the models from model-series a. It is noteworthy how strong its impact on the re-entry itself is, and especially how much it carries away from the original effect of social origin. Thus, the broader eligibility in Sweden to some degree nominal eligibility, but does de facto not lead to enrollment of previously disadvantaged. Or in other words, the inequality in late enrollment in Sweden stems to a certain degree from earlier inequalities in the secondary education system. For the working classes, however, there are significant coefficients of parental working class origin left after controlling for the secondary track.

The strong reduction through the simple ‘type of eligibility’-variable suggests that more information on the secondary educational career should be controlled before

attributing inequality to mechanisms at the time of re-enrollment itself. The filtering function of the secondary system seems to be stronger than expected from the beginning – but granting entry into higher education nominally to everybody, makes the effects only visible when scrutinizing on participation in postsecondary education.

In sum, in Sweden social origin remains influential even on later transitions back from work to school. Origin effects are strongly reduced by a very simple measure for earlier scholastic performance, the type of upper secondary degree. Further, although not studied in more detail in this chapter, the bivariate analysis in Appendix 3.2.10 suggests that the difference in the hazard rates by class comes to an end after several years in the labor market.

3.2.8.3 United States

For the US, the data availability is the best among all of the three cases. Important compositional variables are:

- race, since affirmative action policies might otherwise lead to an underestimation of the class of origin effect;
- regional disparities in working class residence and the availability for college education – captured by a multiple dummy variable for being born in a rural area and growing up in the south of the US or being born outside of the US;
- the birth cohort – even though the range of birth cohorts in the NLSY is very small and they are close together – as correction for business cycle effects and for the fact that some measures have been taken at a different age for the different birth cohorts;
- the number of siblings for the same reason as in Germany and Sweden: lower-class families on average have more children, which reduces their capabilities of financing higher education.

Holding these variables constant, a significant effect on the disadvantage of both lower classes remains throughout the models. The pattern with inequality through all of the three transitions – including the re-entry – is robust.

A number of intermediate variables play a role in the US that may explain the class inequality. First, performance in school and test-scores from cognitive tests are

indicative for performance in college entry tests. The NLSY79 contains the afqt-test[15] on cognitive performance for the full sample. For the cohorts I selected, the test has been carried out before the completion of high school. Furthermore, the track chosen in high school can be used as a proxy for school performance; here as a dummy variable indicating whether the respondent was in a college preparatory track or not. These performance measures are included into the models together with two alternative explanations: the poverty status of the respondents' household at age 18 corrects for the familiarly un-affordability of higher education. While there are at least theoretical possibilities in Germany and Sweden to finance higher education for poorer families, costs are much higher in the US and credit constraints can be assumed to play a stronger role. Finally, one may wonder whether early aspiration are built before leaving high school and then define what will happen throughout the entire sequence of transitions. This can be captured in the NLSY79 as young respondents have been asked about their favorite occupation. These occupations can be coded into classes according to the same scheme as the social origins.

Controlling for these three simple mechanisms already captures most of the inequality. The resulting models are shown in the b.-columns of table 3.2.3. There is no remaining net effect of class on the attainment of a high school diploma or GED, and inequality in re-enrollment reduces drastically to an insignificant coefficient. Even though later analyses in section 4 will show that inequality in higher education has to be studied in a more differentiated way for the US, the three mechanisms can explain the overall inequality in re-entry quite well. What is not shown in the analysis here but has been uncovered in a number of different model specifications, is that the most important intermediate variables – explaining away by far most of the class inequality – are the afqt-test scores and the attendance of an academic track in high school. The other two mechanisms are relatively unimportant.

Nevertheless, the poverty variable reveals an interesting insight. It has strong impact on the first transition, but then its effect reverses: young adults from poor families do not enter the labor market as fast as those from more affluent backgrounds. Then on the re-enrollment transitions, there is no more significant effect left. First of all, this shows that there is a group of poor households with children who

[15] The Armed Forces Qualification Test (afqt) is a test on cognitive performance (IQ) which includes a number of different dimensions such as word-knowledge, math skills or paragraph comprehension. Often it is referred to as the asvab-battery.

at the same time are not able to either find work or finance education. Second, even though this interpretation is paired with the violation of some methodological assumptions, it seems that the effect of poverty vanishes more over time than the influence of scholastic performance. This suggests – similar to the findings for Sweden – that late inequality has its roots earlier in the life course and early investments are crucial. But it also implies that late entry may have its contribution to a reduction in educational inequality as far as financial constraints are the reason for refraining from enrollment.

Table 3.2.3: Parametric accelerated failure time regression: qualification for higher education, labor market entry and re-enrollment: United States.

	all cases: high school diploma or GED		**if HS-Diploma or GED:** entering the labor market before higher education		**if in the labor market:** re-entering postsecondary education	
	a.	b.	a.	b.	a.	b.
parents class (ref.: service classes)						
- intermediated classes	0.04***	-0.00	-0.14***	-0.10**	0.44**	0.22
	(3.32)	(-0.17)	(-4.91)	(-3.91)	(2.42)	(1.19)
- working classes	0.07***	0.00	-0.17***	-0.11***	0.59**	0.22
	(6.33)	(0.26)	(6.10)	(-4.04)	(2.97)	(1.06)
- single parent, inactive	0.22***	0.12***	0.01	0.03	.16	-0.24
	(8.95)	(5.05)	(0.24)	(0.50)	(0.42)	(-0.63)
Male	0.04***	0.03***	-0.09***	-0.09***	0.62***	0.58***
	(4.62)	(3.64)	(-4.14)	(-4.27)	(4.14)	(3.75)
race (ref.: white)						
- black	-0.01	-0.08***	0.15***	0.12***	0.08	-0.26
	(-0.65)	(-4.77)	(3.99)	(3.17)	(0.29)	(-0.90)
- Hispanic	0.01	-0.03	0.04	0.02	-0.06	-0.20
	(0.45)	(-1.52)	(0.84)	(0.53)	(-0.21)	(-0.64)
Rural	-0.00	-0.01	0.01	0.03	0.15	0.08
	(-0.64)	(-0.88)	(0.30)	(1.42)	(0.84)	(0.46)
place of birth (ref.: non-south)						
- south	0.04***	0.03**	0.01	0.01	0.23	0.15
	(4.54)	(2.93)	(0.28)	(0.29)	(1.35)	(0.86)
- non-US	0.04	0.03	0.18**	0.16**	0.02	-0.08
	(1.80)	(1.12)	(3.18)	(2.87)	(0.05)	(-0.21)
afqt percentiles		-0.003***		0.001**		-0.01***
		(12.60)		(2.57)		(-4.09)
high school track: college preparatory		-0.04***		0.12***		-0.32
		(-4.29)		(5.35)		(-1.94)
hh at age 18 poor		0.08***		0.05*		0.16
		(6.30)		(1.97)		(0.75)
class aspiration (ref.: service)						
- intermediate class		-0.00		-0.03		0.21
		(-0.32)		(-0.99)		(1.03)
- skilled working		0.03*		-0.07**		0.30
		(2.11)		(-2.48)		(1.30)
- unskilled working		0.05**		-0.02		0.79*
		(2.84)		(-0.40)		(1.98)
Constant	2.83***	3.05***	1.29***	1.10***	5.83***	7.12***
	(99.87)	(96.56)	(18.55)	(14.51)	(13.10)	(13.32)
ln γ	-1.93***	-1.99***	-1.22	-1.27	0.29***	0.28***
	(-108.18)	(-113.78)	(-73.87)	(-76.26)	(6.39)	(6.12)
N	3107		2522		2233	

t statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Further compositional covariates, not shown in the output: birth cohort, number of siblings (dummy variables).
a. compositional covariates kept constant.
b. compositional covariates and likely mechanisms related to scholastic performance and motivation kept constant.
Data source: NLSY79; own calculations. Not weighted.

3.2.9 Discussion and Conclusion: Early Openness, Late Inequality?

The results of the different countries differ at the core between Germany on the one side and Sweden and the US on the other side. Using a step by step-approach from non-parametric methods towards a parameterization I have compared three educational transitions during young adulthood in detail between the three societies. The Swedish and the US system are both characterized by low inequality in the early transitions and higher inequality on later transitions, the German system on the contrary manifests stronger inequalities in the earlier transitions. The fact that Sweden and the US lump together and not the two European systems indicates a central role of the education system instead of the labor market regulation. Sweden and the US are both similar in their strong open access policy to postsecondary education, while the Swedish employment protection legislation is rather similar to Germany. In contradiction to the hypothesis that stricter employment protection legislation will reduce the number of lower class entrants after they established themselves at work, inequality in re-enrollment is low in Germany and in Sweden at least not higher than in the US.

What makes the US and the Swedish system so similar is a combination of high rates of young adults being nominally qualified to enter higher education and the openness of the education system. Both grant the theoretical chance to enter higher education to less well prepared young adults. At the same time, the higher education system welcomes non-traditional students with comparatively open arms – re-enrollment is possible at any time at rather convenient conditions for students with parallel commitment in other life domains. The broad nominal eligibility and an open and flexible system for non-traditional students may overall reduce inequality. However, it is also a part of the reality of these systems that higher education is delayed and transition patterns are more complex. And, as this chapter has shown, that over time inequality in educational attainment prevails: later enrollment is, just like earlier enrollment, strongly influenced by class. In this way, a part of the class inequality that has been hidden behind expanding eligibility for higher education almost to universality manifests later in educational attainment throughout adulthood. Thus, even though these systems equalize education by expanding access opportunities, at least a part of it becomes ineffective later through unequal re-enrollment rates in particular of lower class children, in Sweden as well as in the US.

This ‘rollback’ of inequality has, however, the interesting characteristic that it can be explained to a large degree by scholastic performance measures from secondary school. The nominal eligibility does not replace the early preparation for academic schooling. The overall pattern of the results can be seen as another hint that early investments into the cognitive development of children might be the more promising way to reduce educational inequalities. One should keep in mind that late flexibility can still reduce inequality by replacing earlier transitions which would select more strongly on social origin. The scope in how far later education can be equal still depends on the secondary education system to some degree, even if it does not nominally or ‘officially’ select those who are eligible for higher education.

Overall, the situation in Sweden corresponds quite closely to the one in the US. This confirms previous studies comparing the US to Scandinavian contexts and finding a similar magnitude of educational inequality (for a recent example comparing the US and Norway see Reisel, 2011). But it contradicts the expectation expressed in chapter 3.1 that the US could have higher inequality due to the fact that the high costs are too high even for enrolling later. The finding also contradicts the opposing hypothesis that high school graduates from poorer families wait or rather work until they enroll, and thus inequality in the US is lower than in other countries or even reversed for later enrolments. In an unlucky situation for the research design, the two mechanisms could counterbalance each other and thus produce such similar results for Sweden and the US. However, a precondition for this scenario would be a higher rate of direct entrants into postsecondary education in the US. Even though there are direct entries and the timing for entry into the labor market is unequal according to social origin, for excluding enough upper class children from the population of potential re-enrollers a much higher rate of direct college entrants would be needed.

One particular explanation for the late inequality in the Swedish and the US system – which is mainly absent in Germany – is the higher selectivity on earlier transitions in the German case and thus a less homogeneous population of potential re-enrollers. This possibility has been left out of the discussion, but could also explain the patterns I have found. Therefore, the next chapter will be devoted for a more thorough discussion.

3.2.10 Appendix: Comparing Parametric and Semi-Parametric Models

Qualitative comparative case studies allow for a much more detailed study of processes within the single countries. This has the great advantage that, besides consideration of substantive historic differences, the methodological approach can be much better evaluated for each single case, avoiding e.g. misinterpretation from simplified findings due to wrong parameterization. This Appendix shows the derivation of the event history model assuming a log-logistic distribution in three steps: first, I plot non-parametric hazard rates, in addition to the survivor curves in the main text of the chapter. Second, I estimate hazard rate models with flexible shapes and hence fewer parametric assumptions and plot a set of predicted hazard rates. And third, I compare these models to the fully parametric models reported in this chapter, using a graphical illustration as well as comparing the coefficients and the entire models according to the AIC-statistic. There are, at least, two things that can be learned from such an investigation. First, it provides a more refined picture than the survivor curves in the main text, in how far a certain transition is indeed time-dependent. And second, whether the log-logistic model-specification used throughout this chapter is an appropriate representation of the timing process for all three transitions in all three countries.

When modeling event histories, the choice of a model can be a crucial decision with a strong impact on the results. In this chapter, I have modeled each transition assuming a log-logistic distribution on the hazard curve. Although this shape is rather flexible and can take many forms, it can still be a wrong specification of the fundamental process. The alternative, the widely used Cox-model, leaves the shape of the hazard function unspecified, but makes the assumption that the curves for different values of independent variables are parallel (parallel hazards assumption). This assumption is violated in several instances what makes the Cox-model a not very useful alternative. Another alternative to the fully parametric models above are semi-parametric models using cubic splines or fractional polynomials. Their underlying strategy is to model the baseline hazard, but allow more flexibility by modeling the shape on different sections of the time scale in a different way. This is achieved by adding a set of additional shape parameters for different 'slices' of the time axis. One class of such models using splines have been suggested by Royston, Lambert and Parmar (Lambert and Royston, 2009; Royston, 2001; Royston and Parmar, 2002). These models allow a very flexible modeling of the shape of the baseline hazard which is much closer to the 'real' shape. But in contrast to the Cox-model, they are able to specify the shape of the hazard function and model it. That enables to compare these models with fully parametric models, both on the basis of model-fit statistics such as the Bayesian (BIC) or Akaikes information criterion (AIC) and on the basis of the graphical illustration of predicted hazard rates from the model (e.g. the baseline hazard rate).

The following models will be compared leading to the AFT-models used in the main chapter. For each model, three figures show the 'evolution' of the parametric baseline hazard rate:

- first, the non-parametric hazard rate by social origin. This curve gives the real hazard rate without any parameterization and without modeling of any covariate. The curves are smoothed with a Gaussian kernel to make a somewhat more general pattern visible and cancel out small bumps from the distribution.

- Second, a set of hazard rates predicted from the 'Royston-Parmar'- or semi-parametric spline models for an ideal case for all three classes of social origin and
- third, the same set of predictions as above from the fully parametric AFT regressions with a log-logistic distribution used in the main chapter.

Further, I report all models in order to check whether strong violations of functional assumptions lead to fundamentally different results. Finally, I report the AIC in order to evaluate the trade-off between model parsimony and correct specification of the hazard rate.

Altogether, this set of robustness check should enable an informed decision for the choice of the models. It serves the purpose of checking whether central results for the different countries could be influenced by modeling issues. Thus, for comparative research such robustness checks seem to be indispensable. As a result, although the log-logistic model turns out to be an extremely rough and imprecise specification, the fundamental conclusions of the chapter are unaffected.

The semi-parametric models are estimated using different sets of knots, but generally a quite large number of user defined knots are set. Increasing the number of knots reduces the model fit due to a loss of degrees of freedom, but leads to a closer approximation of the true shape. The odds metric is chosen over the hazard metric since models derived from odds metric closely correspond to log-logistic models and the model fit often turned out to be slightly better in previous work (Royston and Lambert, 2011).

In conclusion, for most cases the figures show that the models represent by and large the process appropriately – with few exceptions. The BIC statistics show that the AFT-models are a possible and more parsimonious simplification of the modeling. In the following, I will discuss the models and the graphical illustrations country by country.

As discussed before, the German system filters early and early inequality is comparatively high. This is mirrored in the hazard rates in the first column of figure 3.2.2. Hazard rates of qualifying for higher education are heavily concentrated around the age at which this transition is expected in the education system, between 18 and 21, and class inequality is high. Only very few young adults catch up. The other two graphs in the first column confirm the results of the survivor curves: there are almost no differences between classes on later transitions.

The second and the third column show predicted hazard curves for a man from the northern state of Schleswig-Holstein, born in 1964 and without any siblings. In the second column the underlying model is the flexible parametric solution. The third column shows the identical prediction from a log-logistic accelerated failure time regression. The shape of the hazards approximates the non-parametric curves fairly well, with the exception of the transition to qualification for higher education, where the parametric model fails to capture the strong decline of all classes. As, however, only very few cases are entering postsecondary education late, coefficients depend on the first section of the time axis. Therefore, this circumstance is not problematic and the coefficients from the non-parametric and the parametric model are in line.

Figure 3.2.2: From non-parametric to parametric models, Germany.

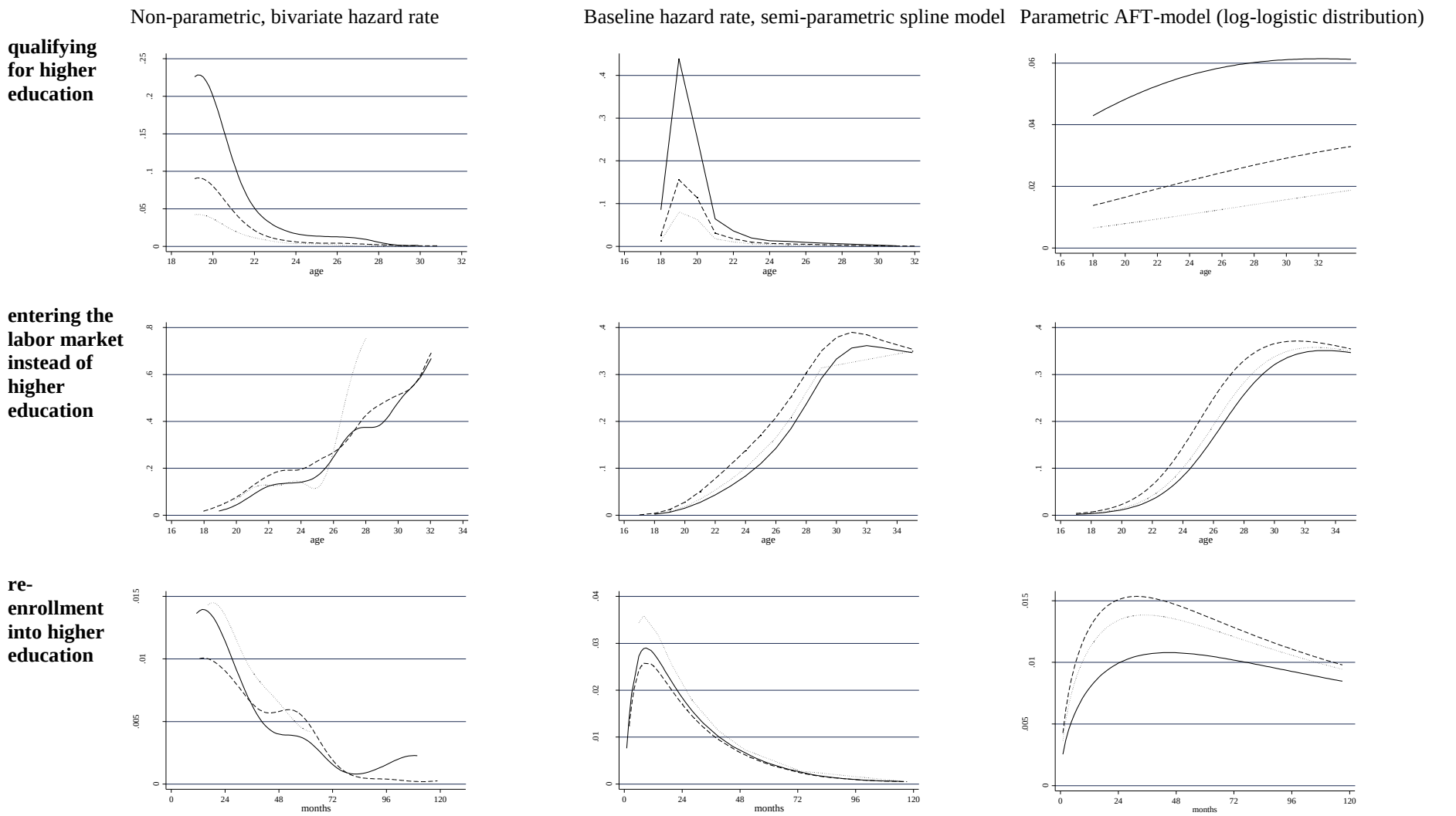


Table 3.2.4: Semi-parametric cubic spline model (Royston-Parmar model), three transitions to re-enrollment, Germany.

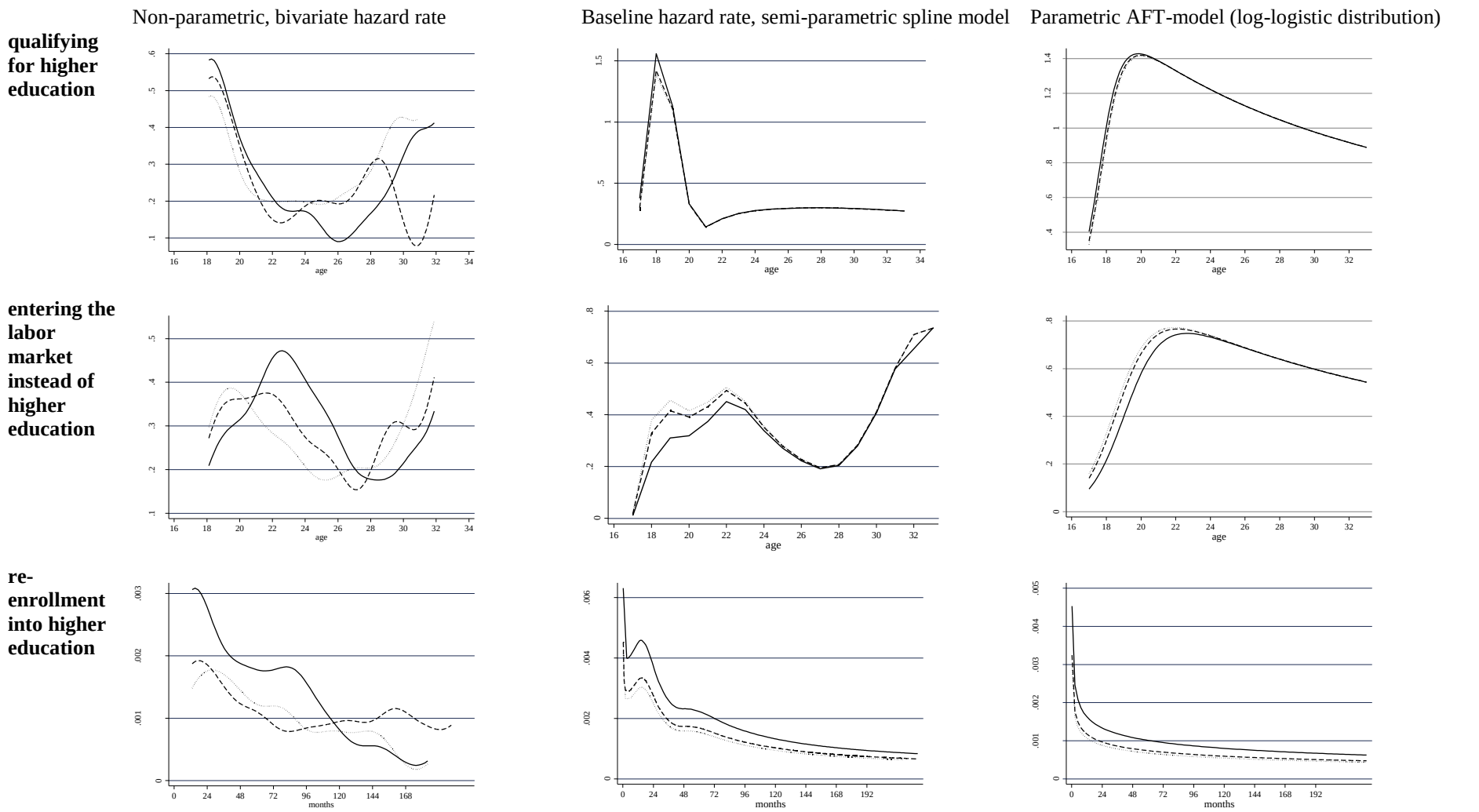
	all cases: Abitur or FHR	**if Abitur or FHR:** entering the labor market before higher education		**if in the labor market:** re-entering postsecondary education	
	a.	a.	b.	a.	b.
parents class (ref.: service classes)					
- intermediated classes	-1.10***	0.75***	0.82***	-0.20	-0.20
	(-11.10)	(5.55)	(5.92)	(-0.65)	(-0.66)
- working classes	-1.87***	0.39	-0.06	0.23	0.29
	(-10.37)	(1.38)	(-0.22)	(0.35)	(0.42)
male	0.08	-0.52***	-0.65***	0.26*	0.36
	(0.82)	(-3.94)	(-4.80)	(0.89)	(1.18)
Abitur or FHR-GPA			0.40**		-0.58*
			(3.09)		(-2.24)
Abitur (ref.: FHR)			-1.29***		2.24
			(-5.78)		(2.13)
constant	-0.36	-0.30	2.02	-2.02**	-4.31
	(-.38)	(-0.78)	(4.46)	(-2.24)	(-3.38)
AIC*	302	-613	-803	989	1000
AIC*: corresponding ll-AFT-model	2657	-598	-612	646	648
N	2227	761		459	

t statistics in parentheses , * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; FHR: Fachhochschulreife.
Further compositional covariates, not shown in the output: birth cohort, number of siblings (dummy variables), state of *Abitur* or *Fachhochschulreife*.
Coefficients for knots omitted.
a. compositional covariates kept constant.
b. compositional covariates and scholastic performance kept constant.
Data source: German Life History Study; own calculations.

The main focus of the analysis within this chapter was though on the re-entry. Here, the picture differs. The non-parametric hazard rates show no bivariate class differences in re-entry and the semi-parametric model controlling for compositional effects confirms this result, even though the parametric model points towards a disadvantage of intermediate class children. Therefore, in order to make a conservative decision, the disadvantage of the middle class has to be attributed to the choice of parameterization. We cannot conclude that social origin has any effect on later entry into postsecondary education in Germany.

The AIC-values show that the first two transitions would both be modeled better with a flexible model than using the fully parametric model. From the predicted hazard rates it can be extracted that the inequality is centered on the first months, but also the overall hazard rates are much higher around this time. In other words, what happens later does not matter too much for the overall process – and therefore the AFT-model can also be justified as a representation of the overall process. The flexible model shows even the early filtering-out in the German system. For re-enrollment, the AFT-model is to be preferred over the flexible parametric model according to the AIC.

Figure 3.2.3: From non-parametric to parametric models, United States.



For the achievement of a high school degree, inequalities in the hazard rates are centered on the first years in accordance with typical age when this degree is achieved. In later years, the hazard rates reverse at least a bit and lower-class children manage to catch up slightly. However, this should be interpreted with caution. First, since the rates are overall, so the initial inequality will weigh more heavily. Therefore the survival curves above showed rather stable inequality, which still exists in the achievement of a high school diploma. Hazard curves simply show that this pattern is already produced in early years. Second, the later achievements are quite often GEDs. As Cameron and Heckman highlight (1993), these are not a full equivalent to a high school degree.

Other life course events arrange according to class in line with this finding. Young adults from lower social origins have a higher hazard rate of entering the labor market earlier in their life, instead of education being the obvious decision during this phase. After these first years, upper-class children – who are still in the risk set (i.e. who have not yet completed higher education) – have a higher chance of starting to work. A possible modeling procedure for this would be piecewise effects models (Bernardi, 2001). However, as the major concern here are early entrants into the labor market instead of postsecondary education, the later catching up of upper-class young adults will be ignored in the following. Given the complex shape of the hazard rate, finding a good approximation for the shape of the survivor curve is rather difficult, as shown by the inconsistent baseline hazard rates for the semi-parametric and fully parametric models. Again, as class differences in early entrance are the main interest and these are captured well by both models, this simplification seems to be not problematic.

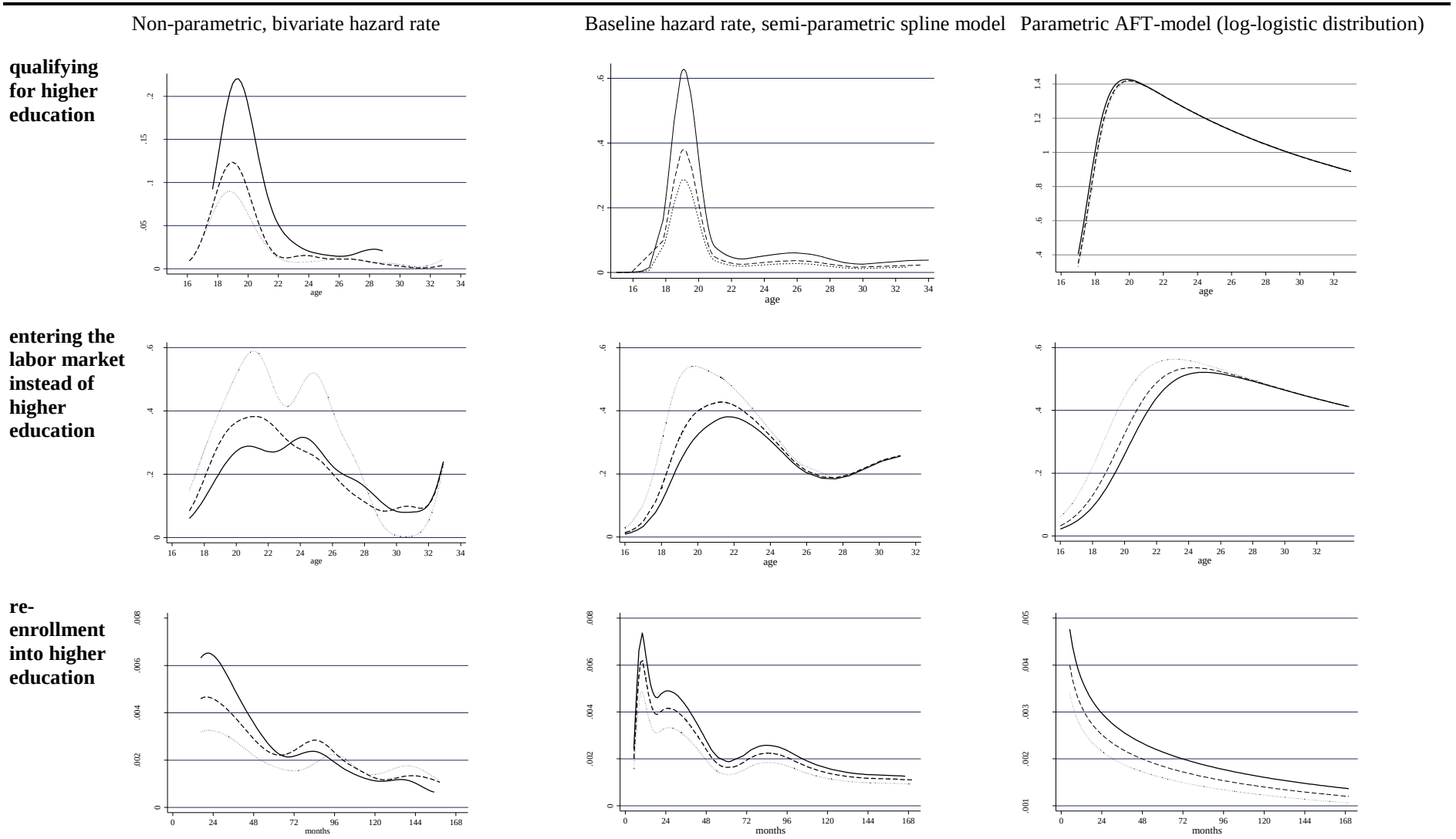
For the re-enrollment, there seems indeed to be a violation of the functional form assumptions – as well as from the parallel hazard assumption. Even though, modeling with a rather flexible model can account for the crossing of the hazard curves, a non-continuous effect would thus be the better specification. For a closer look into the US case and a better model also with regard to the gender specificity of the process I here refer to chapter 4.5. For the comparison it should be noted that the finding of continuous inequality is driven by the first three or four years after the labor market entry – and cannot be generalized to later re-entries. This might also be the reason that the AIC-values of the AFT-model are about the same size as for the more flexible model. As the flexible model, however, also suffers from the problem that it cannot model piecewise effects on the time axis, a yet different modeling strategy is needed and I will stick to the AFT model for the moment.

Table 3.2.5: Semi-parametric cubic spline model (Royston-Parmar model), three transitions to re-enrollment, United States.

	all cases: high school diploma or GED		**if HS-Diploma or GED:** entering the labor market before higher education		**if in the labor market:** re-entering postsecondary education	
	a.	b.	a.	b.	a.	b.
parents class (ref.: service classes)						
- intermediated classes	-0.42***	-0.08	0.26**	0.21**	-0.31*	-0.17
	(-4.94)	(-0.88)	(2.97)	(2.36)	(-2.30)	(-1.20)
- working classes	-0.65***	-0.05	0.34***	0.25**	-0.43**	-0.16
	(-7.18)	(-0.49)	(3.60)	(2.50)	(-2.95)	(-1.01)
- single parent, inactive	-1.31***	-0.47**	0.15	0.14	0.11	0.15
	(-8.58)	(-3.03)	(0.82)	(0.74)	(0.75)	(0.52)
male	-0.42***	-0.37***	0.21***	0.23***	-0.40***	-0.45***
	(-6.60)	(-5.56)	(3.10)	(3.19)	(-3.64)	(-3.89)
race (ref.: white)						
- black	0.01	0.52***	-0.34**	-0.28*	0.00	0.17
	(0.05)	(4.40)	(-2.78)	(-2.16)	(0.02)	(0.79)
- hispanic	-0.20	0.12	-0.02	0.03	-0.02	0.15
	(-1.49)	(0.87)	(-0.11)	(0.18)	(-0.10)	(0.64)
rural	-0.11	-0.08	-0.06	-0.12	-0.16	-0.08
	(-1.41)	(1.05)	(-0.69)	(-1.43)	(-1.19)	(-0.57)
place of birth (ref.: non-south)						
- south	-0.26***	-0.11	-0.04	0.05	-0.13	-0.10
	(-3.59)	(-1.46)	(0.58)	(0.62)	(-1.00)	(-0.76)
- non-US	-0.38*	-0.31	-0.42*	-0.40*	0.04	0.07
	(-2.19)	(-1.76)	(-2.18)	(-2.07)	(0.13)	(0.22)
afqt percentiles		0.02***		-0.003		0.01***
		(15.32)		(-1.65)		(4.25)
high school track: college preparatory		0.31***		-0.30***		0.24*
		(4.21)		(-3.79)		(1.95)
hh at age 18 poor		-0.43***		-0.11		-0.14*
		(-5.18)		(-1.15)		(-0.86)
class aspiration (ref.: service)						
- intermediate class		0.06		0.06		-0.15
		(0.64)		(0.69)		(-1.01)
- skilled working		-0.11		0.15		-0.23
		(-1.13)		(1.45)		(-1.33)
- unskilled working		-0.10		0.18		-0.60*
		(-0.81)		(1.17)		(-2.17)
constant				-1.11		0.27
				(-9.33)		(1.53)
AIC*	-7277	-7114	-4849	-4698	3052	2795
AIC*: corresponding ll-AFT-model	-5862	-5914	-3909	-3839	3057	2798
N	3107		2522		2233	

t statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Data source: NLSY79; own calculations.
Further compositional covariates, not shown in the output: birth cohort, number of siblings (dummy variables); Coefficients for knots omitted.
a. compositional covariates kept constant.
b. compositional covariates and likely mechanisms related to scholastic performance and motivation kept constant.

Figure 3.2.4: From non-parametric to parametric models, Sweden.



The predicted survivor curves in columns two and three of figure 3.2.4 refer to a male born between 1955 and 1957 in a large city in Sweden who grew up without siblings. The shape of the hazard rates can, overall, be approximated well by the semi-parametric model. The log-logistic AFT-model fails to model the process of early sorting out, as the distribution is extremely right-skewed. In this case, the model cannot capture the basic process. The reason is the definition for 'qualifying for higher education': only qualifying by secondary education is counted as an even in this model. Thus, the underlying event typically happens early and class inequality in this 'regular' way to higher education is much stronger than a plot of nominal eligibility – such as the survivor curves in figure 3.2.1 – would suggest.

Table 3.2.6: Semi-parametric cubic spline model (Royston-Parmar model), three transitions to re-enrollment, Sweden.

	all cases: qualifying for higher ed. by secondary ed.	**if qualified by sec. ed.:** entering the labor market before higher education		**if in the labor market before completing HE:** re-entering postsecondary education	
	a.	a.	b.	a.	b.
parents class (ref.: service classes)					
- intermediated classes	-0.52*** (-4.31)	0.39** (2.42)	0.09 (0.53)	-0.18 (-1.31)	-0.07 (-0.53)
- working classes	-0.84*** (-7.18)	1.18*** (7.38)	0.77*** (4.77)	-0.42*** (-3.24)	-0.27* (-1.95)
male	-0.25** (-2.67)	-0.27* (-2.12)	-0.23 (-1.84)	-0.55*** (-5.15)	-0.56*** (-5.22)
born outside of SE	-1.59*** (-5.81)	-1.04** (-2.49)	-0.85** (-2.00)	-0.07 (-0.28)	-0.02 (-0.07)
full qualification for higher education			-1.76*** (-11.35)		-0.55*** (4.27)
constant	0.45 (1.85)	-0.16* (-0.52)	1.28*** (3.81)	-0.48 (-1.73)	-0.78*** (-2.70)
AIC*	-32.12	-1016	-1149	3327	3880
AIC*: corresponding ll-AFT-model	1556	-888	-979	3890	3311
N	1822	765		1622	

t statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Further compositional covariates, not shown in the output: birth cohort, number of siblings (dummy variables), size of community of birth place. Coefficients for knots omitted.
a. compositional covariates kept constant
b. compositional covariates and scholastic performance kept constant
Data source: LNU; own calculations.

As with the AFT-models in the main text, most of the inequality among re-enrollers can be explained by the type of eligibility. I.e. the early inequality in the eligibility has long-lasting consequences. For the labor market entry and for re-enrollment, the shape of the hazard function can be better approximated with the AFT-model than for the transition to eligibility. The AIC-values suggest that a more complex modeling in Sweden would lead to a better fit – but the substantive conclusion confirms the findings from the AFT-models in the main text.

3.3 Selective Processes and Late Inequality

This chapter discusses the problem of sample selection in a multiple-transitions setting. While not offering a definite solution, the problem is discussed and illustrated. I apply different solutions which have been suggested in the literature and show that their results largely confirm my conclusions from chapter 3.2. However, there are several inconsistencies calling for a cautious interpretation of these results. Overall, selectivity is shown to be a potential explanation for some the country differences, while the overall pattern presented in chapter 3.2, with higher inequality in the open and non-selective systems, is confirmed.

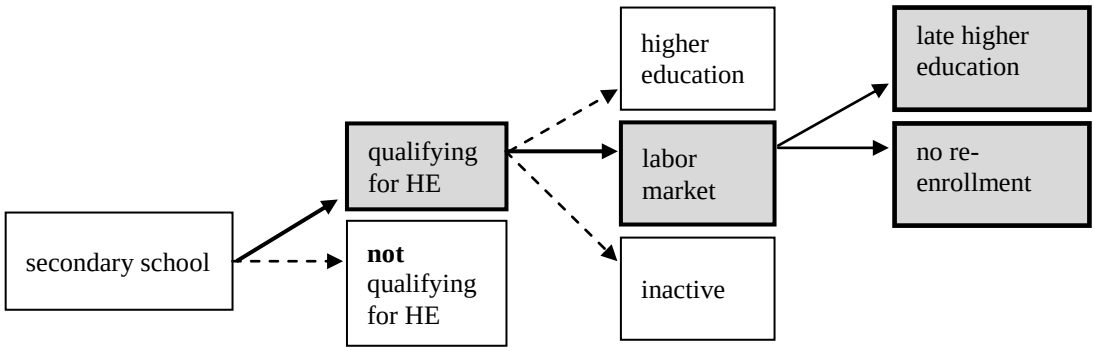
3.3.1 Introduction

One possible explanation for the observed higher inequality in re-enrollment in open education systems is that these systems select the population that could potentially re-enroll less restrictively. The potential of this technical selection hypothesis will be discussed in the current chapter. Selection into the risk group is, just as in other educational transition models, can technically interfere with the comparability of countries. Cameron and Heckman (1998) challenged the common finding of waning coefficients over the life course – i.e. that inequality is lower in transitions at older age – and show that sequential binary choice models are sensitive to selection bias. Hence, a documentation and careful description of possible selection processes is a necessary precondition for comparative research. In addition, I present results from applications of the common attempts to model the selection process. These, however, all rely on very restrictive assumptions. The main aim of the chapter lies on the documentation and discussion of selective processes in educational careers, their illustration and discussion of the consequences for the country comparison.

Assessing the influence of social origin on the re-entry into higher education can be understood as an extension to the ‘Mare’-model or sequential logit-/probit-model which has been a standard tool of educational research for many decades (Mare, 1980; Shavit and Blossfeld, 1993). In such a model, educational outcomes are not studied as an ordinal or nominal variable of educational achievement. Instead –

just as in chapter 3.2 in this volume – they are modeled as a process of transitions in which individuals stay in or leave education. Figure 3.3.1 illustrates which transitions are involved and how the sample selects into a more and more selective sub-population possibly returning into postsecondary education.

Figure 3.3.1: Transitions into 'late' education



With regard to re-entry from work into education chapter 3.2 has shown that there are social background effects on the re-entry into school, just as in any other educational transition. These effects are at a moderate level compared to earlier transitions and they differ between countries. In Sweden and the US, the two countries with lower inequality in eligibility for higher education, the inequality in the re-enrollment rates were higher. As discussed below, this finding could be due to technical selection processes.

3.3.2 How Sample Selection Works and Why it is a Problem for Comparing Inequality in Late Enrollment between Societies

Sample selection is often seen as a source of bias for estimates from observational studies in the social sciences. King et al. (1994) give an intuitive description of the impact of sample selection on empirical studies and summarize it as follows:

> '… the inferences are likely to be biased since, if the explanatory variables do not take into account the selection rule, *any selection rule correlated with the dependent variable attenuates estimates of causal effects on average*.' (King, Keohane and Verba, 1994, p. 130)

Such a selection rule is obviously given in the case of re-enrollment decisions of young adults: previous transitions in the educational system determine whether re-

enrollment is possible and relevant for an individual. The impact of sample selection on the association between any variable x and a dependent variable y is intuitively easiest understood when imagining the most extreme case: a dependent variable that does not vary at all. If for example y is poverty, a sample of either only poor or non-poor people will not allow any inference on its causes. Most cases are less extreme, but selectivity will nevertheless attenuate the association between variables that we observe. If a linear relationship between any independent variable x and poverty (y) exists, the relationship would be underestimated if poverty also determines whether the cases are in the sample. The poverty example is a realistic one: if for example homeless people are not in the sample, it is likely that the poorest of the poor are missing. The resulting dependent variable is then called 'truncated'. If there is a true relationship between this truncated variable and another variable, estimators based on this sample will be downwardly biased.

A similar situation occurs when the sample is complete, but the dependent variable is limited in a certain way, defined as a 'censored' dependent variable. In the case of censoring, we know about the existence of those cases without valid observation on the dependent variable, but in beyond the problem remains. In educational transition models, both truncation and censoring can occur as a function of the independent variables and the exact sampling process.

How does this selection problem relate to the research question on re-enrollment into education in young adulthood? I hypothesize that all estimates of effects on re-entry are likely to be attenuated by sample selection, in particular in more selective country contexts such as Germany. However, I argue that this not necessarily to be seen as a source of bias.

First, truncation of the dependent variable 're-enrollment' is likely to occur. Sample selection in the educational transition model generally derives from the fact that all earlier transitions determine each later transition and therefore the remaining group at risk to make the next transition (Buis, 2011; Cameron and Heckman, 1998; Hansen, 1997; Mare, 1980). It is very likely that the passing of previous transitions depended on the same factors as the probability of making the present transition; the processes have to be understood as interrelated whenever conclusions are drawn. The first selection process is the qualification to enter higher education. Hence, social origin effects on the entry into higher education depend on the strictness of selectivity

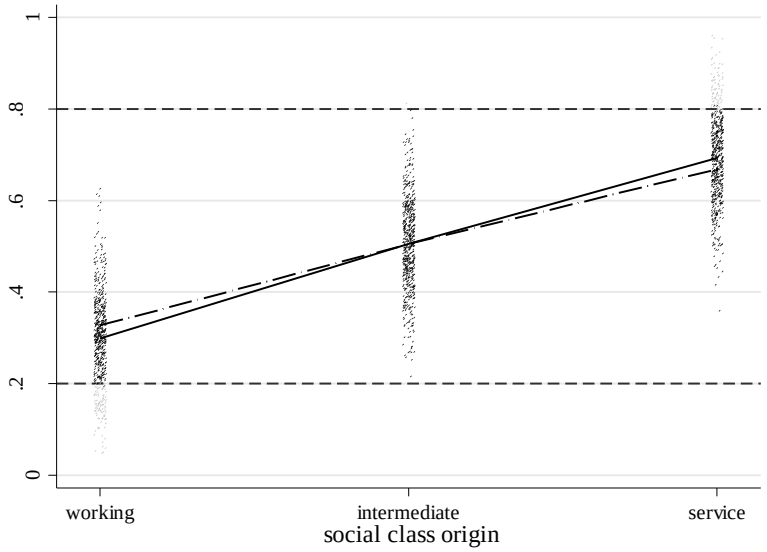
of becoming eligible. Using simulated data, figure 3.3.2 gives a graphical illustration of this process. Assuming

a. that a latent variable y* predicts whether a person i enters education at any point: the higher y*, the higher the probability to enter education
b. y* is – at least to some degree – constant over the life course and
c. y* cannot be observed in empirical studies.

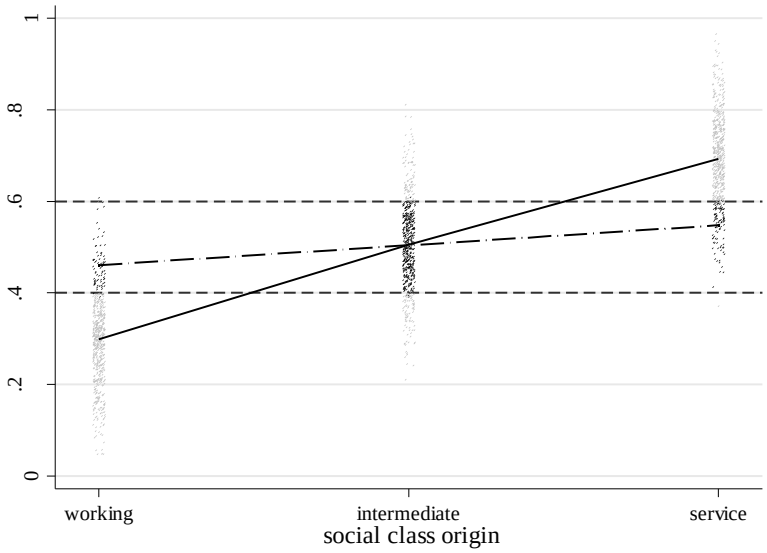
With the dashed lines the figure mark the level at which y* is truncated by earlier educational transitions. For the populations that can potentially re-enroll into postsecondary education from the labor market, two such lines have to be drawn: on the one side, highly aspiring youth is more likely to qualify for higher education. As we know, levels of selectivity of qualification for higher education vary greatly between countries (cf. chapter 1.4). The lower dashed line exemplifies the truncation of y* by qualification for higher education. Highly aspiring youth on the contrary are more likely to start higher education right away after high school instead of entering the labor market. The upper dashed lines in the figure illustrate this process. The solid line is the hypothetical regression line on the full sample; the dashed regression line is estimated based on the truncated sample. The upper graph simulates the link between class and re-entry in a society with low selectivity: potentially everybody is eligible to enter higher education and the majority of youth does not enter before working some time. The lower graph shows the more strict selection case where few individuals qualify for higher education but those who qualify typically enroll immediately. Comparing the difference of the full sample regression line and the realized sample regression line between both graphs, illustrates two important properties of the results from highly selective samples: even though the solid lines depicting the ‘true’ relationship are identical, the slopes of the actually estimated regression lines (dashed lines) differ and are lower under the stronger selection condition. Both, truncation at the lower and at the upper end of the distribution of y* contribute to this.

Figure 3.3.2: Different grades of selection and their consequences on the estimation of slope-coefficients, simulated data.

Condition 1: Weak selection: access nearly universal, few entering higher education directly



Condition 2: Strong selection: access exclusive, many entering higher education directly



black dots: cases within sample
grey dots: cases out of sample

'true' slope

slope estimated from selected sample

Second, the degree of selectivity is determined by the education system. In the context of a comparative study on the re-entry decision into education, I will not discuss the problem as a source of bias, rather as a possible explanation for country differences that has far reaching implication for conclusions from comparative research.

Selectivity is rather closely linked to characteristics of the educational system, and hence for comparative research, rather an explanans of country patterns than a methodological problem. I will therefore avoid the frequently used term 'selection bias' and refer to 'sample selection' instead.

Previous studies found lower inequality coefficients at later educational transitions over the life course (Shavit and Blossfeld, 1993), and these have been attributed to different causes (see Lucas, 2009 for a brief discussion). From a life course perspective, one could interpret lower coefficients at later transitions as a result of the older age (Müller and Karle, 1993). While younger individuals might be more dependent on their family, for older individuals more independence can be expected. Also resources which are important for inequalities in early educational transitions might become obsolete, such as cultural or parental economic resources (Bourdieu and Passeron, 1977). Re-enrollment as the latest possible transition would then be least affected by social origin. If this hypothesis holds true, policies 'removing' earlier institutional selectivity would lead to more independent decisions and hence equalize education. While this mechanism might be able to explain the waning coefficients pattern or findings on generally lower inequality in countries with less earlier selection, the findings of larger effects on later transitions in less selective countries (presented in chapter 3.2) cannot be explained with this mechanism.

The selectivity mechanism on the other hand, which has already been discussed by Mare when he initially formulated the continuation ratio- or Mare-model (Mare, 1980), was since then repeatedly suggested as the reason for waning coefficients (e.g. Cameron and Heckman, 1998). Education systems pre-select the population of potential re-entrants – at differing degrees – and the patterns found in the previous chapter would be consistent with this explanation. If the higher effects of origin found in the US and Sweden are due to the lower selectivity of an open and flexible education system, the German system has to expect an increase in inequality in later educational transitions if the higher education system undergoes reforms towards de-institutionalization via more flexibility.

An alternative interpretation of bias is endogeneity of later transitions to earlier decisions. This would be the case if the later enrollments are all a function of the same process which determines whether individuals enter the population at risk or not. In the scenario of delayed higher education, this could be the result of wrongly

assuming that educational choices are made with a short time horizon. If this assumption does not hold and the same process determines early and late enrollment, inequality in early transitions would be biased downwardly under settings allowing delayed entry while the inequality in the later stages would be an overestimate. It only occurs due to the process which has already taken place, but was determined to occur from the beginning. The results from chapter 3.2 point towards such a situation: the existing inequalities in higher education are explained fairly well by much earlier educational performance. In this case, coefficients could also be biased upwardly due to endogeneity. Inequality in the early transition out of the education system can predefine re-enrollment for some (presumably upper class) young adults and a permanent exit from education for others. Then, inequality actually occurs at this transition but only manifests later. In chapter 3.4 I discuss the consequences of this hypothesis and in chapter 4.1 I empirically test the assumptions using German survey data.

3.3.3 Variables Possibly Causing Selectivity or Endogeneity: Academic Performance, Motivation, Aspiration, and More?

In theory, if variables could be observed that are intermediate between social origin and the decision to re-enroll, we would be able to model the mechanisms for selectivity in each country and estimate their relative importance for the existence of social origin effects. If mainly selectivity is at work, variables truncated by earlier transitions should be able to explain more of the origin effects in flexible contexts and ideally, if all relevant variables would be perfectly measured in the model, the remaining class coefficients in the different country contexts would be equivalent. Obvious candidates for variables being presumably truncated in more selective systems are scholastic performance and motivation or aspiration for education.

Mare (2011) discusses the dilemma of this approach: many of the variables causing selection at earlier transitions are outcomes of the family background. Variables such as ‘ability’ test scores or educational aspiration are at the same time mechanisms explaining the family background effects, as they are correlated with the selection rules. As a consequence, he raises the question whether it is always wise to control for these variables. Keeping them statistically constant results in estimates net of selection but also net of a mechanism explaining a part of the inequality. As Mare summarizes: ‘A blanket control for all unobserved variables is likely to over-control

for the effects of the treatment' (Mare, 2011, p. 244). Conclusions would then be as difficult as without modeling selection on unobserved variables. The possibilities of statistical modeling is limited at this point by the nature of the situation (see also Xie, 2011).

System Characteristics and Selectivity

As discussed in the previous chapter, the selectivity into the risk group of re-enrolling students can be the reason for any country differences. With regard to social origin effects, Holm and Jæger (2009) show that the countries vary in the grade to which social origin effects are biased by early selection. The same authors find that the effects are rather constant over the transitions, and show the waning pattern to a much lower degree than in the ordinary educational transition model, when accounting for selectivity (Holm and Jæger, 2009; Holm and Jæger, 2011).

The case with strongest selectivity on the first transition into eligibility for higher education is Germany. Only a small share qualifies for higher education and class effects are already strong in even earlier selections. Hence, for the first step of selection the hypotheses for the system characteristics are straightforward: the strong selection in Germany reduces the origin effects that are observed on later stages, i.e. we should find the smallest class effects there and the highest in the US and Sweden. Sweden could stand somewhere in between, since selectivity of labor market entries instead of a direct transfer from secondary school to college is lower in the US. Furthermore, only after a longer phase of work the pre-selection is completely annulated in Sweden by the 25/4-rule.

On the re-entry decision, again selection should attenuate the origin effects most in the German sample, since selection in the first step is so strong that the relatively low number of students who do not achieve higher education before their first labor market experiences should not be able to counterbalance this.

Beyond the selection mechanism over transitions, the challenges in the case of a comparison between countries with regard to inequality throughout the educational career are even greater and other technical problems may occur. First, because the selection into the population at risk for re-enrollment occurs not in one but two steps. The group selecting into the sample by qualifying for higher education differs most likely in many respects from the group selecting into the labor market instead of a

straight enrollment in higher education. Second, because of the additional problems of comparing logit- or probit-coefficients over populations due to differing unobserved heterogeneity even with regard to non-confounding variables (Auspurg and Hinz, 2011; Best and Wolf, 2010; Buis, 2011; Holm and Jæger, 2009; Mood, 2010). While this scaling-problem is indeed likely to affect the following probit models, the rather similar results based on predictions from the parametric models and the flexible parametric models in chapter 3.2, especially the comparison of median times, ensure me that the basic pattern exists independently from bias through different scaling.

Although much effort has been invested, a final solution that could quiet all concerns seems impossible at the moment. In the following I will discuss different attempts of dealing with this question, namely detecting sample selection, observing and controlling variables measuring selection and modeling sample selection directly. In particular the recent special issue of the journal *Research in Social Stratification and Mobility* edited by Marten Buis (Volume 29, Issue 3: Unobserved Heterogeneity in Mare Models) is a helpful resource in this context.

3.3.4 Selecting on Purpose in a Non-Selective Society

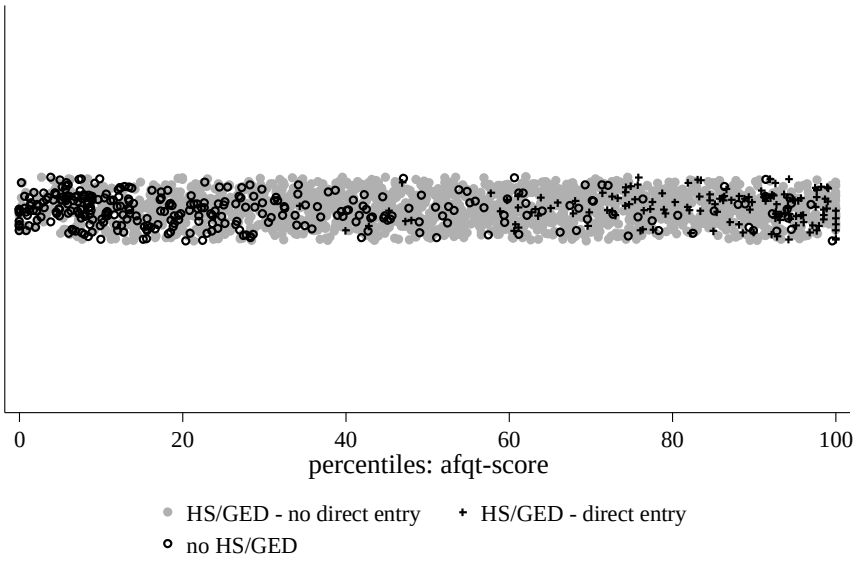
For a qualitative comparative case studies the selective process can be illustrated graphically by imposing selection rules that are assumed to apply for the most restrictive societies on the least selective country cases, even though under yet other assumptions. This approach can only offer an illustration of the scope that different selectivity of earlier educational transitions *might* have, under the assumption that we know the criteria of the selection. The idea is simply to select a sample which, under several assumptions, would have been the selected group in e.g. the US if selectivity of the German system would be applied. This transfer can never be perfect and has a number of obvious problems; it is however a straightforward way to show the potential of selectivity if convincing criteria for purposive selection can be found. In the following, I will present several scenarios applying the selection rules as present in the very selective German case on the US.[16]

The first scenario assumes that the selection occurs due to differences in cognitive performance. The NLSY79 includes ‘IQ’- or ‘cognitive performance-’test

[16] The reason for choosing the US is that a better set of variables being potentially able to explain selection is available in the NLSY79 dataset than in the Swedish LNU.

scores (afqt-scores). For checking whether the higher inequality of late entrants occurs due to a broader sample selected into the population at risk, I use these scores and select the upper same 30 percent who made the transition to eligibility in the GLHS sample. Obviously, the assumption that the selection in the German system is based on the type of cognitive performance being measured within the afqt-score is hard to justify, but this criterion can serve as a crude approximation for equalizing the selection rules over the countries.

Figure 3.3.3: Achieving high school diploma or GED, direct transfer into higher education and the position within the distribution of afqt-percentiles.



Note: X-axis represents the afqt-percentiles, range of the y-axis is 0, existing variation introduced randomly to improve visibility of the different educational careers pathways (data-points 'jittered').
Data source: NLSY79, not weighted.

As figure 3.3.3 shows, the transition patterns are highly correlated with the afqt-score. There are hardly any respondents below the afqt-median and making a direct transition into higher education (depicted as small +-signs). On the other hand, the vast majority of the young adults without a GED or high school diploma (depicted as small circles) are clearly below the median afqt-achievement.

Table 3.3.1: Class effects on re-enrollment in the US after imposing sample selection according to different scenarios of purposively selection.

		Scenario 1: selection on basis of afqt-score as depicted above	**Scenario 2:** selection by track in high school	**Scenario 3:** selection by track in high school plus aspiration	**BASELINE:** full model
classes	service classes	ref. cat.			
	intermediate	-0.23 (-1.85)	-0.10 (-0.88)	-0.02 (-0.12)	-0.20 (-2.33)
	working classes	-0.31 (-2.02)	-0.22 (-1.63)	-0.21 (-1.21)	-0.29 (-3.12)
N		627	845	531	2233

Data source: NLSY79; own calculations, not weighted.

This indicates how much the selection process in the US depends on the score as measured in the afqt-test. In table 3.3.1 the class coefficients, estimated within a sample selected according to this first scenario, are shown. The coefficients turn out to be almost identical with the probit coefficients of re-enrollment from the full sample in the same table below. Thus, there is no indication for strong selection from these test scores.

In the second scenario I alter the selection rule. Instead of a threshold on a continuous variable, the criterion for selection into the sample is now the track in high school. This rule is probably the scenario which corresponds closest to the selection rules applying in Germany. Early selection in the secondary school system, which is nominally much less important in the US and Sweden, could still work in similar way through different channels. Results are reported in the second coefficient-column of table 3.3.1. The coefficients and z-values within this sample are again smaller and those young adults from the intermediate class of origin are almost identical in the probability of re-enrolling with those from the upper classes.

In the third scenario I restrict the selection further on those who most strongly manifest their motivation towards higher education. This selection rule is likely to correspond to a context where upper class parents channel their offspring early towards the academic track to ensure status reproduction. Furthermore, this somewhat more restrictive rule may be better suited given the difficulty of measuring

high school track in the US via self-reports (Rosenbaum, 1980). In order to ensure capturing a population with a strong intention to realize a certain class position through education, I restrict the population to those young adults reporting a service class position as the desired occupation. As the third coefficient-column of table 3.3.1 shows, applying this restriction reduces the coefficients further in size, especially for the intermediate classes. Even for the working classes, only non-significant differences to the service classes are left. This finding, even if one might not want to make too much out of it, can at least serve as a warning sign not to draw too strong conclusions from the country differences. Selection might change the story at least to some degree and the overall country differences would probably be smaller if all countries would be more selective. Further, selection on different variables results in completely different degrees of attenuation of the class coefficients. The strength of the impact on the coefficients strongly depends on which variable causes selection.

3.3.5 Sensitivity Analysis

While often doubts are left about measuring all variables of selectivity, it might still be possible to detect the vulnerability of the results against selectivity. Manski (1995) has suggested to start with worst case bounds assigning all censored observations into the treatment group for one bound, and doing the opposite (i.e. assigning all censored cases to the control group) for the other bound. For the case of students re-enrolling into postsecondary education, this leads to far too broad bounds, in particular for Germany where only a very small number qualifies for higher education.

A more useful strategy for the context of sequential logit models of educational transitions is suggested by Buis (2011), who also implemented it in the statistical software Stata as part of the 'seqlogit.ado'-package (Buis, 2007; Buis, 2010). As a sensitivity analysis, this package allows estimating sequential logit model under different scenarios concerning the presence of an unobserved variable. Table 3.3.2 reports the results of one out of many possible applications of this software for all of the three transitions and the three relevant country cases. For technical details, I refer to the respective publications; in particular Buis (2011). Apart from estimating different scenarios according to the effects of the unobserved variable over the transitions, the module allows specifying a functional form at which the unobserved variable is to be presented. In line with the illustrations above, I specified a uniform

distribution throughout which implies that the order of the elements causes selection, rather than the 'real' values according to a metric scale. In table 3.3.2, logit coefficients over various scenarios assuming differently strong effects of an unobserved variable are shown. The main interest lies on the third transition.

Table 3.3.2: Sensitivity analysis: the effect of a uniformly distributed standardized unobserved variable on all three transitions.

	effect of a standardized variable on each of the three transitions:			
Reference: service classes	0 (baseline Mare logit model)	0.2	0.5	1.0
United States				
1st transition: eligibility for higher education				
intermediate classes	-0.75 (3.96)	-0.75 (3.96)	-0.77 (-3.96)	-0.80 (-3.97)
working classes	-1.28 (-6.90)	-1.29 (-6.90)	-1.31 (-6.90)	-1.39 (-6.92)
2nd transition: not entering higher education directly				
intermediate classes	0.98 (4.92)	0.98 (4.90)	0.99 (4.85)	1.00 (4.68)
working classes	2.18 (6.35)	2.18 (6.34)	2.19 (6.30)	2.19 (6.15)
3rd transition: re-entering postsecondary education				
intermediate classes	-0.29 (-1.99)	-0.29 (-1.98)	-0.29 (-1.96)	-0.31 (-1.92)
working classes	-0.42 (-2.66)	-0.42 (-2.67)	-0.44 (-2.69)	-0.48 (-2.74)
Germany				
1st transition: eligibility for higher education				
intermediate classes	-1.27 (-11.70)	-1.28 (-11.70)	-1.34 (-11.71)	-1.54 (11.74)
working classes	-2.17 (-10.91)	-2.19 (-10.93)	-2.28 (-11.07)	-2.57 (-11.48)
2nd transition: not entering higher education directly				
intermediate classes	0.55 (3.18)	0.54 (3.11)	0.50 (2.79)	0.37 (1.86)
working classes	0.22 (0.59)	0.20 (0.55)	0.13 (0.33)	-0.12 (-0.28)
3rd transition: re-entering postsecondary education				
intermediate classes	-0.22 (-1.01)	-0.24 (-1.04)	-0.28 (-1.18)	-0.39 (-1.56)
working classes	0.27 (0.54)	0.25 (0.51)	0.19 (0.37)	0.01 (0.02)
Sweden				
1st transition: eligibility for higher education				
intermediate classes	-1.02 (-7.61)	-1.03 (-7.61)	-1.08 (-7.62)	-1.23 (-7.63)
working classes	-1.40 (-10.93)	-1.41 (-10.93)	-1.47 (-10.96)	-1.69 (-11.04)
2nd transition: not entering higher education directly				
intermediate classes	0.74 (3.40)	0.73 (3.36)	0.71 (3.14)	0.63 (2.49)
working classes	1.10 (4.90)	1.09 (4.84)	1.06 (4.57)	0.96 (3.71)
3rd transition: re-entering postsecondary education				
intermediate classes	-0.58 (-2.50)	-0.59 (-2.52)	-0.63 (-2.61)	-0.76 (-2.84)
working classes	-0.84 (-3.90)	-0.86 (-3.93)	-0.92 (-4.06)	-1.11 (-4.44)

Data sources: NLSY79, GLHS 64/71, LNU 91/2000; own calculations, not weighted.

Looking at the third transition, which is re-enrolment, the result shows that both the working classes and the intermediate classes are much more affected by such a scenario in Germany than in the US. The US coefficients hardly change over the strength of the unobserved variable, while the consequences for the German sample are somewhat stronger. However, this also applies to the least selective Swedish system. Particularly strong is the distortion on the first transition – again for all of the three contexts.

Overall, the results from the scenarios estimated do not change the central conclusion within any of the contexts, but point towards some attenuation of later coefficients in particular for Sweden. The conclusion, that inequality in the German context is not present remains even in the scenario with high values for the effect of an unobserved variable, and Sweden remains the context with the highest inequality in re-enrollment. For the hypothesis that the higher values are produced by the non-selectivity of the systems in the US and Sweden, this is negative evidence. I would have expected that the German coefficients change considerably more, and especially that the last transition – back from work to school – is affected most.

3.3.6 Modeling Sample Selection

Contrary to the approach suggested by Buis, which was applied in the last paragraphs, most researchers dealing with the problem follow the strategy of modeling the distortion of coefficients by estimating the influence of an unobserved variable under strong assumptions. Modeling sample selection has been a major concern to econometricians for decades and also entered the debate on the development of inequality throughout educational transitions. A number of statistical techniques have been proposed to correct for selection, all of them relying on strong assumptions. In sum, either an instrumental variable (exclusion restriction) is needed, what is hard to justify for a chain of such similar process as the sequential entry into more education. Or strong distributional assumptions are required (Cameron and Heckman, 1998)[17].

Both of these broad strategies for modeling sample selection have recently been used to deal with similar problems in education transition research. Modeling

[17] The solution Cameron and Heckman suggested first is an ordinal choice model and leads, according to a simulation by Tam, to stable and valid results if applied on large datasets (Tam, 2011) As an ordinal choice model does not describe the process of re-entering appropriately, I will follow a different strategy.

selection based on distribution assumptions was suggested e.g. by Holm and Jæger (2011). Applying bivariate probit models over two transitions, the authors seek to model unobserved heterogeneity based on the assumption of a bivariate normal distribution of an unobservable variables. The bivariate normal probit model can be extended to multivariate probit models for more than two regression equations with a binary outcome. The estimation relies on multivariate normal probabilities and is performed by simulated maximum likelihood (Cappellari and Jenkins, 2006; Greene, 2008, pp. 582-83)[18]. In principle, this strategy might enable to model the two transitions out of the education system and back into it simultaneously. Setting up the models in Stata is made a great deal easier by the cmp-command (Roodman, 2011). In comparison to the original Mare-model and the approach suggested by Buis, this solution needs to rely on probit- instead of logit-models due to the non-existence of a multivariate logistic distribution.

Both, identification through an exclusion restriction as well as through distributional assumptions are possible. If the size of the datasets allows estimation, I will apply both strategies in the following. This serves as a documentation of their outcomes and as an attempt to illustrate the rather unclear nature of selection remaining after usage of these approaches. Further, by showing that the basic results remain stable after this additional check I want to indicate robustness of my findings from chapter 3.2. Estimating the models, however, was accompanied by several problems. In addition, for Germany the very demanding condition of a very strong selection on both of the first transitions might be problematic. Since the modeling strategies are all prone to error and the number of cases is small for estimation, I will not spend much space on this analysis.

Avoiding the assumption of a multivariate normal distribution is only possible when identifying the multivariate probit model by way of an exclusion restriction approach for certain transitions. Even though justifying the choice of an exclusion restriction is equally difficult as justifying the multivariate normal distribution, this strategy is sometimes followed in research on educational inequality (e.g. Bernardi, 2011). The problematic prerequisite for a variable which serves as exclusion restriction is that it must cause the earlier transition but be unrelated to the second one. Bernardi suggested using the local rate of probability for entering the

[18] The estimation employs the implementation on the Monte Carlo method of Geweke, Hajivassiliou, and Keane (GHK) (Cappellari and Jenkins, 2006)

population at risk. I followed this approach for the first transition and use the rate of eligible students available for given geographical conditions. Rather than states, I have to rely on broader geographical conditions since information on the states are not always available for Sweden and the US. For the US, I refer to the south/non-south or foreign residence in youth crossed with the criterion of urban or rural residence at the same age. The same strategy is applied for Sweden, where I use the direct qualification rate of rural, urban or foreign birthplaces. For Germany I take the respective rate on the state-level (Bundesländer).

Table 3.3.3: Class coefficient from a multivariate probit model.

Reference: service classes	no exclusion restriction	exclusion restriction: geographical elig. rate	incl. grades / test scores, no excl. restriction	incl. grades / test scores, excl. restriction	Baseline Mare-model in probit form, no test scores
United States					
1st transition: eligibility for higher education					
intermediate classes	-0.36 (-3.81)	-0.34 (-3.55)	-0.07 (-0.72)	-0.07 (-0.68)	-0.35 (-3.68)
working classes	-0.62 (-6.46)	-0.59 (-6.23)	-0.12 (-1.11)	-0.11 (-1.09)	-0.60 (-6.26)
2nd transition: not entering higher education directly					
intermediate classes	0.51 (4.52)	0.53 (5.34)	0.65 (3.87)	0.30 (2.70)	0.50 (4.98)
working classes	1.01 (5.55)	1.05 (7.26)	0.30 (2.69)	0.65 (3.84)	1.00 (6.74)
3rd transition: re-entering postsecondary education					
intermediate classes	-0.11 (-0.91)	-0.01 (-0.11)	-0.05 (-0.70)	-0.06 (-0.76)	-0.20 (-2.33)
working classes	-0.16 (-0.82)	0.03 (0.20)	-0.00 (-0.05)	-0.01 (-0.12)	-0.29 (-3.12)
rho 1st and 2nd	0.59	0.60	0.68	0.61	-
rho 1st and 3rd	-0.23	-0.82	-0.94	-0.95	-
rho 2nd and 3rd	-0.01	-0.32	-0.50	-0.42	-
Germany					
1st transition: eligibility for higher education					
intermediate classes	-0.77 (-11.62)	-0.78 (-11.6)	collinear w. GPA	collinear w. GPA	-0.74 (-11.5)
working classes	-1.23 (-11.7)	-1.21 (-10.9)	coll. w. GPA	coll. w. GPA	-1.16 (-11.2)
2nd transition: not entering higher education directly					
intermediate classes	0.34 (2.09)	0.45 (2.37)	0.31 (2.83)	0.30 (2.74)	0.31 (2.83)
working classes	0.12 (0.39)	0.33 (0.87)	0.01 (0.06)	0.00 (0.02)	0.06 (0.24)
3rd transition: re-entering postsecondary education					
intermediate classes	-0.13 (-0.33)	0.22 (0.82)	-0.25 (-2.26)	-0.25 (-2.27)	-0.11 (-0.74)
working classes	0.20 (0.33)	0.71 (1.77)	0.15 (0.59)	0.14 (0.56)	-0.14 (-1.32)
rho 1st and 2nd	-0.06 (-0.10)	0.18	-1.0	-1.0	-
rho 1st and 3rd	-0.03 (-0.05)	-0.62	X	X	-
rho 2nd and 3rd	0.01 (0.06)	-0.23	X	X	-
Sweden					
1st transition: eligibility for higher education					
intermediate classes	-0.61 (-7.43)	-0.56 (-6.69)	-0.61 (-7.44)	-0.55 (-6.69)	-0.56 (-6.71)
working classes	-0.83 (-10.69)	-0.79 (-10.10)	-0.82 (-10.65)	-0.79 (-10.09)	-0.80 (-10.1)
2nd transition: not entering higher education directly					
intermediate classes	0.37 (1.55)	0.45 (1.91)	0.31 (1.51)	0.39 (2.90)	0.45 (3.44)
working classes	0.56 (1.76)	0.63 (2.05)	0.41 (1.58)	0.56 (3.74)	0.66 (4.98)
3rd transition: re-entering postsecondary education					
intermediate classes	-0.15 (-0.46)	-0.51 (-2.23)	-0.36 (-2.22)	-0.03 (-0.18)	-0.35 (-2.43)
working classes	-0.26 (-0.61)	-0.75 (-2.67)	-0.55 (-3.12)	-0.09 (-0.55)	-0.55 (-4.06)
rho 1st and 2nd	0.89	-0.03	-0.24	0.83	-
rho 1st and 3rd	0.03	0.44	0.15	-0.18	-
rho 2nd and 3rd	0.20	0.53	0.09	-0.13	-

Data sources: NLSY79, GLHS 64/71, LNU 91/2000; own calculations, not weighted.

Results of this analysis are documented in short form in table 3.3.3. The furthest right column contains the baseline Mare-model in probit formulation. In the first coefficient-column from the left, the coefficients of a model 'correcting' for selection bias on the transitions without exclusion restriction are reported. In the second column the same model applying an exclusion restriction is shown. For the US, the results on the third transition show that the baseline model-coefficients are overestimates, which is in line with the selection hypothesis.

For Germany, results are highly inconsistent between the techniques. Nevertheless, one core result of chapter 3.2 is confirmed: inequality on the third transition back to school is small or does not exist. How ambiguous the results of such models can be is best illustrated by the Swedish example. When following the distribution assumption approach, the uncorrected Mare-probit-coefficients would be an overestimate of the 'true' coefficients. When specifying an exclusion restriction, the opposite would be true: the baseline model would appear to be an underestimate. Hence, there is not too much that can be learned from these results but the conclusion that certain questions might not be solved at the moment and no robust statistical result could be achieved.

In the third and fourth column from the left, the former models (column one and two in table 3.3.3) are repeated including controls for the scholastic performance as in chapter 3.2. The differing quality of the measures makes the models impossible to directly compare coefficients between countries. There is, however, an interesting finding from these coefficients too. The models confirm the story from chapter 3.2 that early characteristics are able to explain away later inequality rather well, irrespective of the selectivity as modeled here. This confirms the role of earlier educational achievements for late inequality again. The only exception is the Swedish model without exclusion restriction (third column). Here, the class coefficients turn out quite large for the last transition, in spite of the control for secondary school track.

Even though inconsistent, the values of rho are overall rather high. This is interesting, as it indicates that inequality in the different transitions is to a large degree influenced by the same variables.

In conclusion, and in line with the discussions of Mare (2011) and Xie (2011) on the limitations of statistical modeling, the effects of selection on the size of

inequality in different transitions could not be fully evaluated. Selecting on observables and several sensitivity analyses have shown that the country comparison can be affected by differing selectivity. Overall, the hypothesis that reducing selectivity on early stages could go along with increased inequality in later education still seems reasonable, but a hard test for it failed. On the one hand, restricting the sample of a non-selective context by observables as well as the sensitivity analysis suggested by Buis both point towards this direction. On the other hand, country differences remain after such tests and all of the central results of chapter 3.2 could be confirmed. The different strategies for modeling sample selection resulted in different, if not inconclusive results. Therefore, such studies relying on one of the two modeling approaches should be interpreted cautiously.

3.4 The Second Chance as a Second Best Chance? Inequality in Pathways Through Higher Education as a Result of Equalization Through Second Chance Education

Inevitably, late entry into education has the consequence of a delayed educational achievement. This chapter turns the perspective from inequality in re-entry, to inequalities in educational career patterns. First, I discuss in what way educational career patterns result from individual decisions and transitions. This illustration has the aim of showing that inequality in delay of education can be both, the result of high inequality within initial entry into higher education and of low inequality in re-enrollment. Second, I present several different measures for the degree of differentiation in educational timing patterns. The results show that the flexible educational systems with attractive options for non-traditional students have a somewhat higher inequality in educational career patterns.

In the previous chapters I have discussed analyses showing inequalities which are persistent throughout the life course. These late inequalities were stronger in societies with an open and flexible education system. The following descriptive country comparison asks about one specific consequence of late entries: the diversification and des-standardization of the overall pattern of educational careers with regard to inequality in the way of achieving postsecondary and higher education.

This chapter will discuss inequality in entire pathways between students from different origins. It is a logical consequence of later (re-)entry into education that those opting for a second chance will complete their education at a later stage of their biography. As trivial as this statement seems to be, the sometimes overwhelmingly positive assessment of ‘lifelong learning’ discussed at the outset of chapter 3.1, ignores the consequence of delayed achievement mostly. Interference of education with other biographical events – e.g. family formation – is just one likely consequence of entering higher education in more mature age. Although there is evidence that graduates who delayed their education can realize returns to their studies (Hällsten, 2011), it goes without saying that the period in which returns can be realized is shorter (cf. section 5 of this volume). Another evitable consequence of second chance education is de-standardization in educational careers among graduates from

postsecondary programs. Inevitably, if second chances are offered for improving the chances of lower-class students, this results in a higher probability for them to become non-traditional students. As a consequence, a new line of inequality could be timing of education. This chapter illustrates the connection between the frequency of late enrollment and empirically compare the stage of de-standadization by social origins for all three comparison countries.

Is the broader availability of higher education linked to frequent detours, delays or interruptions of lower-class students? Do working class students, even when achieving eventually the same final level of education, less often take the 'royal road'? Although institutional conditions can be expected to be important pre-conditions for the existence of such a pattern of delaying lower class children, comparative research on these questions is rare. The aim of this chapter is a comparison of social origin effects on the educational career pattern in the three countries being studied in this volume, the US, Germany and Sweden. First, I will discuss some conceptual issues on the relation between transitions into educational programs and timing patterns. This is complemented by a more systematic approach in the Appendix. Second, the chapter describes inequality in the emerging patterns of higher education careers in the three societies using different methodological approaches. Finally, I discuss some implications of this analysis.

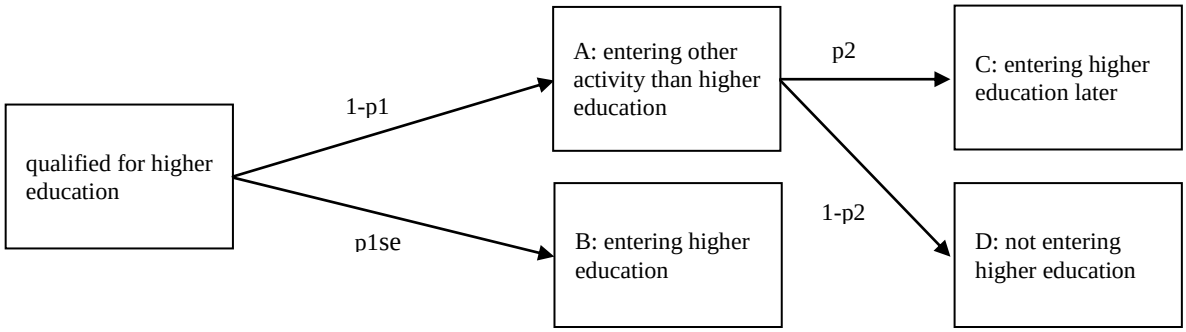
Non-traditional patterns through higher education, such as late re-enrollment after an initial phase of work, vocational training or motherhood occur in all societies, but differ in frequency. Previous studies for Germany (Jacob, 2004; Jacob and Weiss, 2010b) and the US (Elman and O'Rand, 2007; Jacob and Weiss, 2011; Milesi, 2010) revealed that in particular lower class offspring follow non-traditional entry routes and take 'educational detours'. For Germany, this finding is stable over a series of cohorts of 20 years (Jacob and Weiss, 2010b).

3.4.1 An Illustration of the Link between Career Transitions and Career Patterns

Intuitively, one would expect that upper class individuals, who re-enroll more often, are in consequence the ones who have to accept a 'time penalty' if they achieve the same level of education. However, this is not necessarily the case. If the direct transition rates of disadvantaged students into higher education are small, they can still be overrepresented among the delayers in spite of the non-enrollers. For

disentangling this circumstance, a sequence of possible transitions into college has to be regarded simultaneously (see Hillmert and Jacob, 2010 for a similar argument). A short visual illustration seems to be helpful before continuing (Appendix A3.4 illustrates this matter in more technical detail). For the sake of simplicity, only two transitions are regarded and illustrated in the tree diagram below (figure 3.4.1): from secondary education to either the labor market or education and from the labor market back into education[19].

Figure 3.4.1: Transition tree: direct and indirect entry into higher education.



In order to assess the timing advantage, group 'B' and group 'C' have to be compared. The share of students delaying higher education – $\frac{C}{(B+C)}$ – shows the amount to which absence from higher education is turned into delay. The pre-requisites for a situation where this share is high within a certain group are

- that there is high initial absence from higher education (i.e. $1\text{-}p_1$ is large) and
- that this is reduced through a high number of re-enrollments (i.e. p_2 is large).

The dependence of students' educational career structure on the interaction between the two transitions is illustrated in the Appendix to this chapter, in particular in figure 3.4.8.

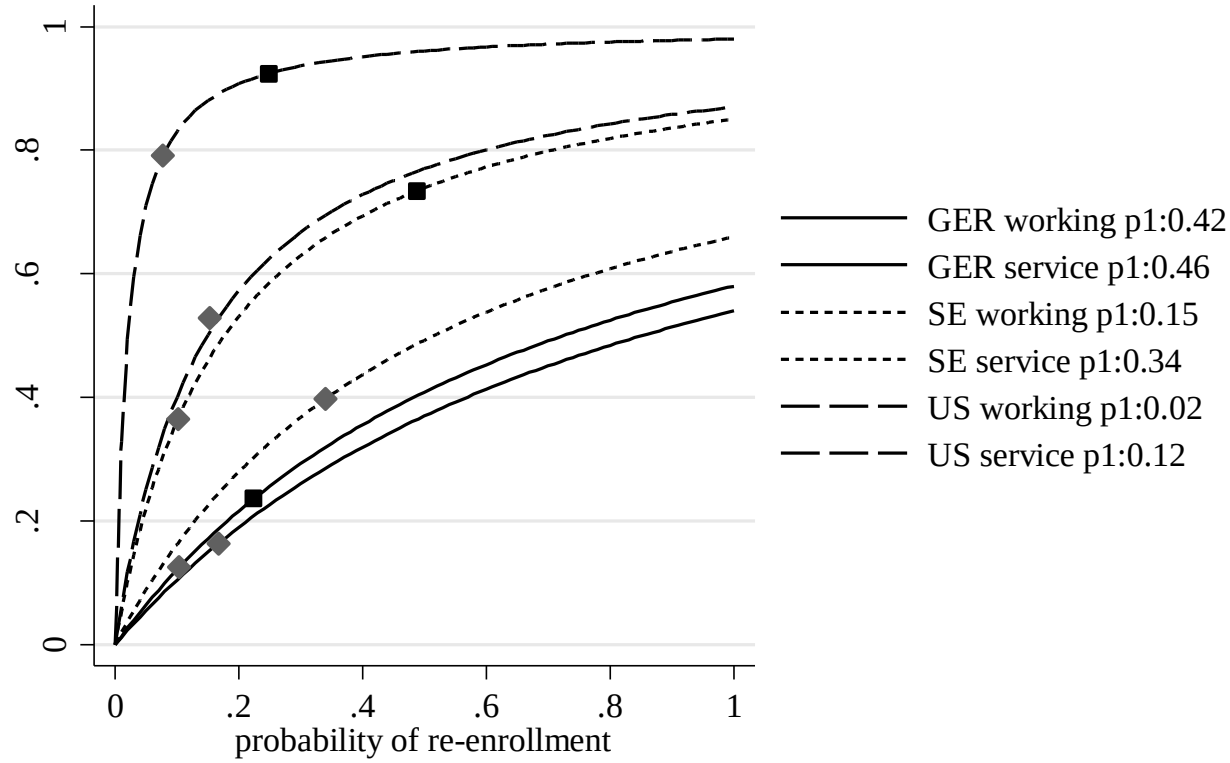
Figure 3.4.2 describes the situation for the three comparison countries. The ordinate denotes the share of late entrants among all entrants into higher education – $\frac{C}{(B+C)}$ – which is a very simple measure for inequality in college-timing. The abscissa denotes the probability of re-enrollment into higher education. In this case, rather

[19] Multiple interruptions and college drop-outs are ignored for the moment.

higher education is the focus and not postsecondary education in general, since the flexibilization-debate (e.g. the debate about the Bologna-reforms) focuses on this sub-system. Which group of students will now lag behind in their pathways through the educational system depends both on the values of p_1 and p_2. If for a given group the value of p_1 is very high – even if all students re-enroll – only a small minority ((1-p_1)*p_2) will be 'non-traditional' students. The curves show $\frac{C}{(B+C)}$ for two different classes of origin resulting for certain empirically given levels[20] of inequality in p_1 at any value of p_2. For each country, the upper curve stands for the working classes and the lower curve for the service classes. The diamond-markers show the empirical combination of p_1 and p_2 – and the resulting inequality in delay – for each group. Moving the markers along the curves shows the change of inequality in timing if the problem of overall inequality is solved to a specific degree by second chances, keeping p_1 constant at its empirical level for a given group. The square-markers indicate the hypothetical re-entry rate (Hp2) that would be needed to completely equalize inequalities in direct college entry by re-enrollments. Although I am aware that complete equalization is unrealistic and will most often not be the aim of policies, I choose this to illustrate the technical connection between the two different probabilities.

[20] The empirical values of p_1 are defined as 'transferring directly into higher education after qualifying for it and staying on until completion of a degree'. For the US, the rate of transfer into four year colleges is used, in Sweden and Germany all full programs of higher education are included.

Figure 3.4.2: Share of late entrants among students in Sweden, Germany and the US for working and service classes.



Data sources: NLSY79; GLHS 64/71; LNU91/00; own calculations.

Figure 3.4.2 shows that within the inflexible German system (with low p1) only in the case of a very high share of re-entrants (i.e. p_2 close to being 1), delay becomes an important dimension of inequality (as indicated by the vertical distance between the diamond-marker on the lower solid line and the square-marker on the upper solid line). In comparison to that, Sweden – with a moderately higher value of $(1\text{-}p_1)$ – has already a much higher share of delayers among all students. For the US, the most extreme case in terms of low direct transfer rates, there is a high rate of inequality in timing even though the chances to re-enter education are lower for the working classes than for the service classes. Under low direct transition rates (p_1) into higher education for one or both groups, compensating inequality even by a small degree through second chance education results in inequality in timing. In figure 3.4.2 this is illustrated by the stronger curvature of the lines under the condition of large $(1\text{-}p_1)$, e.g. in the US. In the US, where the amount of re-entering students outnumbers direct entrants, there is a disadvantage pattern in all aspects: working class children do not transfer directly more often, re-enroll later less often, and nevertheless have a higher

probability of a non-standard educational career if they complete a degree. In Sweden, the situation is less extreme. Both groups take detours at about the same rate, due to the high number of re-entrants among the service class children. Germany – as the least flexible system – shows less inequality on that level of the educational career. In this country context, detours are taken by service class children somewhat more often. The square-markers show that equalizing access to education through second chances would introduce inequality in the timing and standardization of education in all three countries at quite a high degree (i.e. large distances on the vertical dimension). Furthermore, they show that extremely high values of re-enrollment by lower class offspring would be needed for equalization (i.e. large values for the service classes on the abscissa) – *at given constant rates of p_1 for the service classes!*

Beyond illustrating the link between re-enrollment rates and inequality in educational career timing, this graph shows how unlikely it is that re-enrollment will contribute to a mass-equalization of postsecondary education. Direct entry rates seem to be the more powerful gateway to equalize education:

- First, because they avoid new inequalities linked to delayed education to lower persistency rates and differing rates of returns for late entrants (see section 5).
- Second, since remaining upper class students are more likely to re-enroll than working class children who opt out early from the education system. Therefore, inequality might even be increased.
- Third, since inequality in the first transition conditions the leverage that a moderate level of re-entrants can contribute to equalization in education.
- Fourth, since the first transition p_1 also influences the leverage which re-enrollment rate has on the inequality in higher education.

It seems important to keep in mind these compositional preconditions when looking 'backward' on sequences of educational careers. In the following, I will describe more carefully the levels of inequality in educational career patterns for those who actually go to school. As the main arguments on the role of institutions centers around the higher education system, I will focus on students entering or completing education within this sub-system.

3.4.2 Empirical Inequality in Educational Career Patterns

Again – as discussed in chapter 2.4 – several more holistic approaches are available for the analyses of entire educational career sequences. A very detailed approach for each country, as e.g. Adelmans toolbox-studies for the US (Adelman, Daniel and Berkovits, 2003; Adelman, 1999; Adelman, 2004; Adelman, 2006), would require much information and makes a comparison more difficult. Therefore, I apply an approach which is somewhat more abstract and disregards the several concrete aspects of the single education systems. The empirical question is whether class inequality in the degree of de-standardization of educational career patterns, which lead to the same outcome, differ between country contexts.

First, I will document the differences in work experience before graduation by class, which is a simple metric for comparing the degree of interruption within educational careers. Second, for a more elaborate description, I compare sequences using the sequence analyses techniques introduced in 2.4.: comparing each sequence based on an optimal metric to the 'ideal' career trajectory. The measure must be able to capture 'timing' or 'complexity' of educational attainment – instead of the 'diversity', e.g. in institutional types of higher education. I therefore distinguish only two states of the life course: 'higher education' and 'other activities'[21]. Only military service is ignored and cut out of the sequences, as it is a compulsory activity for most German men of the cohorts I study. The datasets used and the analysis samples are the same as in the previous chapter: the NLSY79 for the US, the GLHS for Germany and the LNU for Sweden.

3.4.3 Work Experience before Graduation

One of the consequences of the intermittence of higher education with work is the considerable amount of work experience that graduates sometimes have accumulated when entering the labor market after completion of higher education. An assessment of the consequences of this circumstance for the labor market entry will be subject to

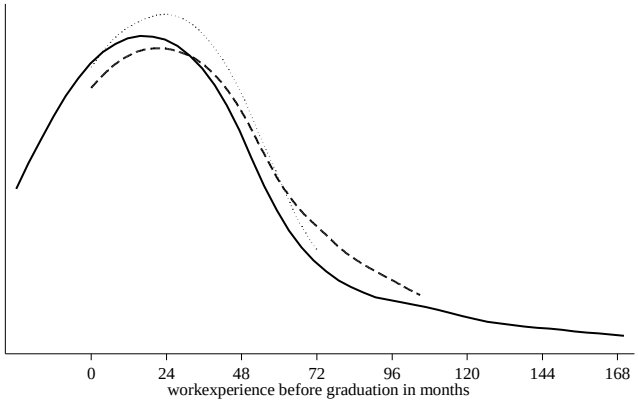
[21] Only two states are distinguished - studying and not studying - and all life courses are left censored below the age of 18 and above the age of 32. In the empirical operationalization of these two events, I regard for Germany both apprenticeship and being enrolled in higher education as 'being in education'. For the US, I have defined participation in education according to the NLSY definition of being enrolled in 'regular school' after receiving a high school degree or GED. This encompasses junior/community colleges and 4-year colleges/universities. For Sweden, all postsecondary education phases being reported retrospectively in the LNU were included. First and last exit (until age 34) from education are reconstructed by the first three months or a longer period of not being in education. Entering the labor market is defined by any work of more than 25 hours per week.

section 5. Fulltime work experience (without being enrolled in parallel!) before graduation also characterizes the educational career. It shows, in how far education was the dominant activity before entering the work career, or if and to what extent labor force participation was also important. Figure 3.4.3 shows the distributions of the number of months of work experience prior to graduation by social origin in all three countries. The distributions are presented as kernel smoothed line plots with a band-with of 12 months.

In all three countries, lower class students gather more work experience before graduation. Social class differences in the amount of work experience are strongest in Sweden, but also exist in the US and to a lower extent in Germany. This suggests that non-traditional careers are more frequent among lower-class than among upper-class students. But it shows too that lower class students have already gathered more work experience when entering the labor market after graduation. From this finding, more careful analyses of the higher education to work transition can be motivated. For graduates, this work experience could be a useful resource in the job search process and the early career. In consequence, lower class children might be able to compensate other disadvantages by their work experience. For the present purpose, however, the amount of work experience is only one dimension of de-standardization of educational careers. The measure is still simplified to a great deal and disregards several other aspects of the participation patterns in education. Therefore, I will go further on by comparing young adults from different social class origins on measures which combine more different dimensions of the educational career pattern.

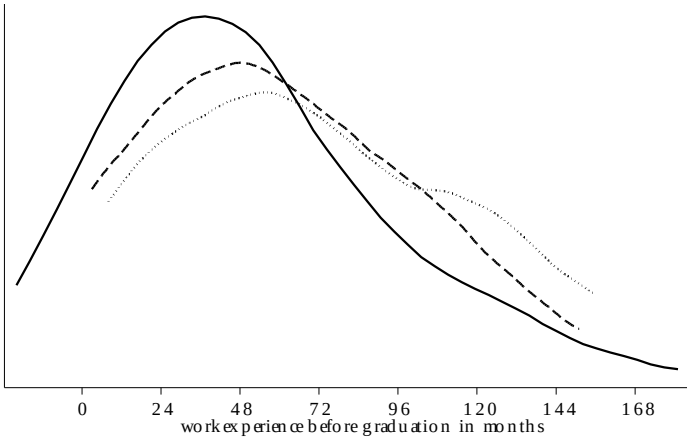
Figure 3.4.3: What happens between entries into the labor market? Distributions of work experience before graduation by class of origin – only those individuals interrupting education.

Germany



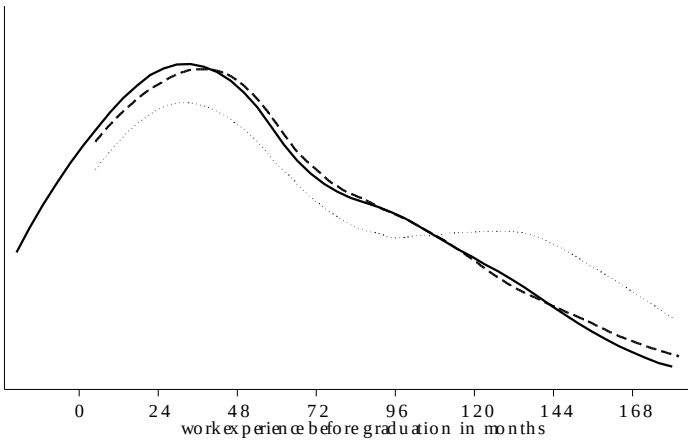
	Mean	N
service classes:	25.9	118
interm. classes:	28.5	148
working classes:	22.3	19

Sweden



	Mean	N
service classes:	59.7	144
interm. classes:	48.8	74
working classes:	77.9	69

United States



	Mean	N
service classes:	33.7	169
interm. classes:	38.1	329
working classes:	38.3	57

legend:
service classes
intermediate classes
working classes

The gap between the first and last transition from education to work for those who do interrupt, i.e. the time between the first work experience and leaving the educational system for good, shows another aspect of educational career timing. It shows the duration of the 'transition phase from school to work'. Conditional on having an interruption within the educational career, the time between the two labor market entries specifies the extension of the school-to-work transition. The results for this aspect of educational career timing are shown in table 3.4.1. Class differences are very strong with regard to this measure. The overall pattern is similar in all contexts: students from lower social origins have remarkably longer gaps between the two events. The values are smallest in the US, where interruptions before higher education are most common. A statistical comparison of the countries is problematic due to the few working class students who graduate from higher education in all three contexts. A further problem for the comparison is that educational programs have different durations. Gaps in the German system are spent mostly in education due to the comparatively long study programs. This fact also limits the possibility for class differences, since the long time-period for the second phase of studies applies to everybody. In Sweden and the US, the share of time spent out of education is higher and having more than one transition from school to work is much more common, as already shown in section 2. Despite the small number of working class graduates, inequality in de-standardization according to this measure is highest in Sweden – in particular since the service classes have rather short gaps. In the US, inequality is somewhat lower since the service classes – as well as the other classes – have a longer phase of transition.

Table 3.4.1: Gap between first and last transition from school to work in months for those visiting the most selective track of the educational system – individuals interrupting education.

Germany	United States	Sweden
visited university:	visited 4-year college:	visited university:
- service classes: 24.6	- service classes: 64.3	- service classes: 45.9
- intermediate classes: 36.9	- intermediate classes: 66.8	- intermediate classes: 58.8
- working classes: 44.2	- working classes: 74.7	- working classes: 87.2

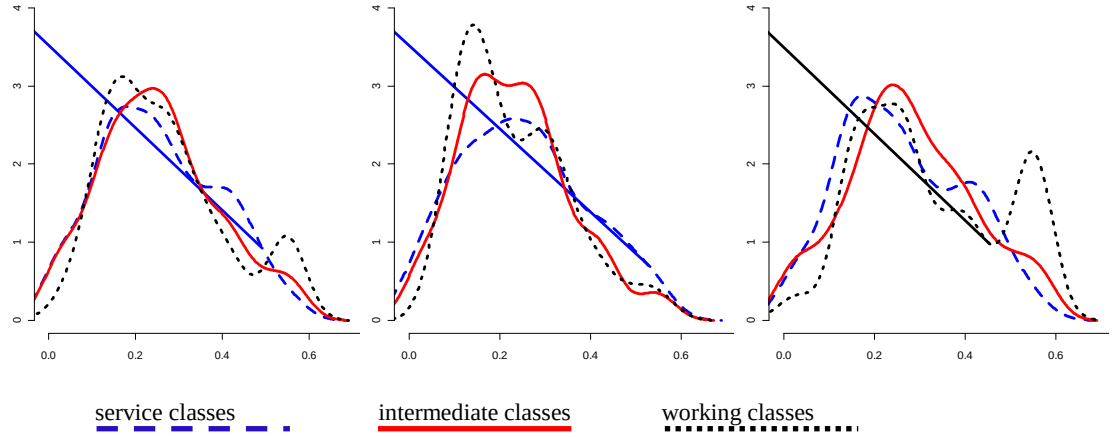
Although showing class differences in educational career structures, this indicator is yet another single aspect of inequality in educational career patterns only. A more

refined measure of the degree to which educational careers are ‘non-traditional’ for all graduates also has to consider how the time between events is spent. A measure combining timing and events in capturing the deviation of educational careers from the national norm has already been discussed in chapter 2.4: the optimal matching (OM) distance to the ‘direct career path’ within a given educational system.

3.4.4 Inequalities in the Patterns of Higher Educational Careers among Graduates

In the following, the optimal matching distance to the direct pathway is applied in order to describe in how far the career patterns of young adults coming from different class backgrounds correspond with the most ‘straightforward’ career in each country. The measure is based on each individual’s optimal matching distance to this ‘direct’ career (see chapter 2.4). The values are standardized on the maximal possible distance in the given society, since the a priori range for distances differs according to the different reference sequences. In figures 3.4.4 to 3.4.6 I report the mean of the distance by social origins for each country and for typical educational outcomes and illustrate their distribution using the respective kernel density estimates. It turns out that the full range of the measure normally lies between 0 and 0.5, where 0 means that a sequence is identical with the ideal career path. This shall be kept in mind when interpreting generally rather small class differences.

Figure 3.4.4: Distances to a direct educational career, Germany.



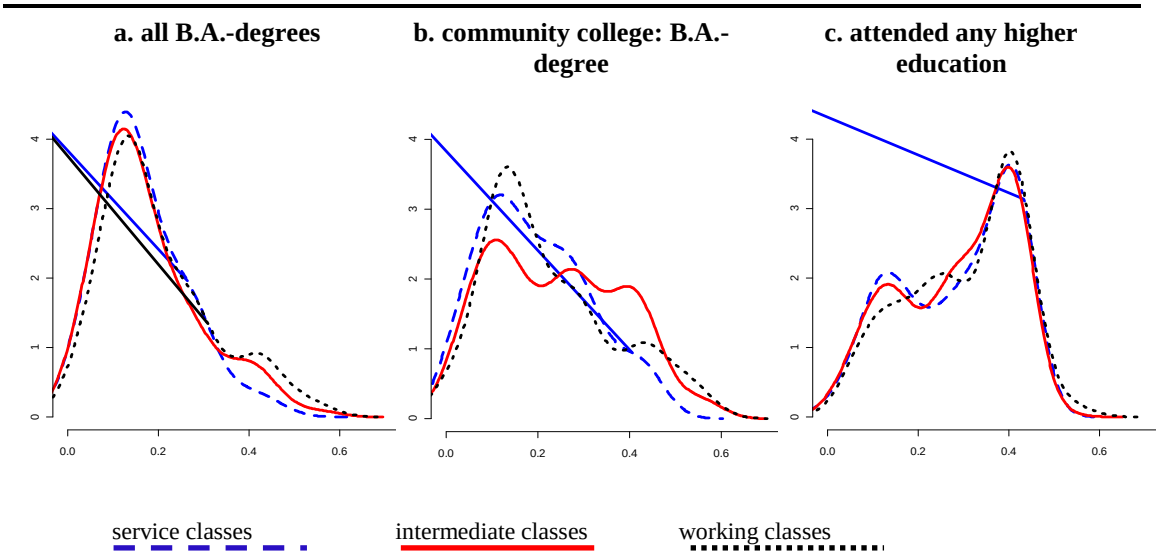
		N			*N*			*N*
service classes	0.25	228	*service classes*	0.25	73	*service classes*	0.24	168
intermediate classes	0.25	172	*intermediate classes*	0.23	84	*intermediate classes*	0.27	104
lower classes	0.27	66	*lower classes*	0.23	37	*lower classes*	0.28	33
total N		466	total N		194	total N		305

For Germany, I selected three groups by their educational attainment. Only students obtaining a degree are considered, since drop-outs are rare compared to the US and Sweden. The left plot includes all students and shows that the majority of graduates from higher education achieve their degree on the direct path, while all classes contribute somewhat to the more complex educational career patterns. The small peak on the right hand of the distribution is attributable to a German particularity: most young adults who interrupt their striving for higher education have to complete vocational training before entering the labor market, and hence have to accept longer detours compared – for instance – to labor market entrants with a high school diploma in the US. This pattern occurs somewhat more frequently among lower-class children.

Due to the small number of cases, splitting up the groups into institutional tracks must be seen as a preliminary analysis. It gives an interesting hint: in column b. and c. of table 3.4.4, the curves differentiate much more by class than in the first column. There is class inequality among university-graduates, but not among *Fachhochschul*-graduates. Inequality is strongest in the most selective track – and is reversed in the lower track where lower classes are progressing somewhat more directly to their degrees.

In the US, the distribution is bi-modal, which indicates that a dichotomy of interrupters and non-interrupters would suffice for describing the situation well (figure 3.4.5, column c.). Most students graduating do so via a comparatively direct pathway through college, which is a result of the known low probabilities of completion of non-traditional students in the US (Bozick and DeLuca, 2005; Roksa and Velez, 2012). When looking at graduates with a Bachelor-degree, inequality in the timing patterns is not very large. In the left column, where all students with a B.A.-degree are pooled, most students, regardless of their class origin, center on the left part of the distribution. There is, however, a difference between classes in the number of outliers at the right tail of the distribution. Here I observe a clear inequality pattern. The working class students achieve their degree most often through non-traditional pathways; the service class students least often. On the right tail of the distribution above a value of 0.4, there are almost only students from the two lower class-categories. Thus, the rare case of completing higher education on a non-traditional way occurs much more often among graduates from lower social origins.

Figure 3.4.5: Distances to a direct educational career, United States.



		N
service classes	0.17	425
intermediate classes	0.18	235
lower classes	0.20	113
total N		773

		N
service classes	0.19	133
intermediate classes	0.24	74
lower classes	0.22	51
total N		258

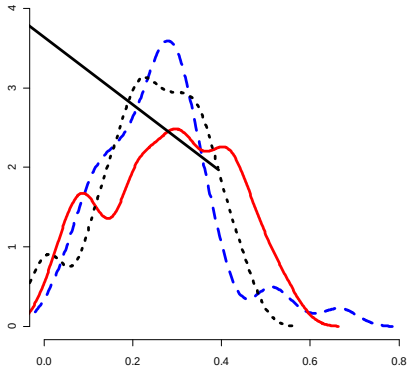
		N
service classes	0.24	392
intermediate classes	0.30	411
lower classes	0.34	292
total N		1095

Plot b. in figure 3.4.5 shows the same comparison between classes of origin for students visiting a community college during their educational career. In this case, the class differences are somewhat more pronounced. As in the German sample, direct pathways are even more frequent among the working classes than among the service and the intermediate classes. At the same time the number of outliers to the right is somewhat higher among the lower classes.

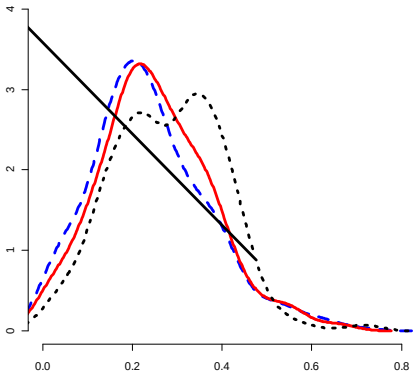
Incomplete higher education frequently occurs in the US – in particular among non-traditional students. Leaving out this group limits the description to a very selective sample: those who manage to complete a degree in spite of a late entry. Therefore, I repeat the analysis in plot c. on the right of figure 3.4.5, including all those students ever entering higher education. This changes the picture completely: the mode of the distribution is shifted to the right – to a pattern that deviates strongly from the reference sequence. As, however, drop-outs can deviate due to the fact that they drop out and not only due to interruptions, this analysis mixes more different sources of deviation. The mean values are now very much in favor of the service classes. This, however, is most likely fueled by a higher number of drop-outs and only partly due to a larger degree of 'career-complexity' of working class Americans. For a characterization of the role of late education for inequality, high drop-out rates of late entrants reported by previous research should be taken into account. If the rate of non-traditional students completing a Bachelor-degree could be increased, the class-inequality in the educational careers to higher education degrees would probably increase as well, since a part of the inequality in plot c. would be 'included' into plot b.

Figure 3.4.6: Distances to a direct educational career, Sweden.

a. obtaining degree



b. attending higher education



service classes — intermediate classes — working classes

		N
service classes	0.26	88
intermediate classes	0.28	28
lower classes	0.25	22
total N		138

		N
service classes	0.22	154
intermediate classes	0.24	39
lower classes	0.28	32
total N		225

In Sweden, as shown by plot a. in figure 3.4.6, the class differences are less important and rather unsystematic – furthermore the number of cases is too small to really draw conclusions. Just as in the US, the drop-outs – which are included in plot b. – make a great difference. Their inclusion into the analysis, leads to a remarkable deviation of the working classes from the standard sequence, i.e. the class inequality in college drop-out must is high.

To sum up, patterns of higher education attendance differ by social origins. Even though the service class offspring more often uses the option to re-enroll, their ways to a degree are on average more often direct and smooth. This leads to the contradictory situation that young adults from lower classes both re-enroll less often and at the same time take less direct ways to a degree. When looking at gaps between the first and the last transition from school to work or at the amount of fulltime work experience among graduates, inequality is largest in Sweden. Inequality in timing is smaller among lower tier graduates in Germany and the US, and the share of working class students completing their degree directly is even higher in these contexts. In Sweden and the US the inequality in the timing pattern among drop-outs is higher. Thus, institutional environments seem to matter a great deal. This, however, is most

likely triggered by higher drop-out rates of lower-class students. The major problem of the analysis is the low number of cases for the German and Swedish case. This does not allow differentiating more by institutional types of higher education, even though the results I have presented suggest that this is an important aspect.

3.4.5 Conclusion

Late entries inevitably have the consequence of a growing number of educational careers through detours. Knowing about these consequences of the promotion of second educational chances is a further prerequisite for evaluating the role of such policies for educational inequality. If countries with generous 'second chances' manage to cancel out inequality in the final attainment by educational credentials but instead have inequality in the pathways to achievement, this would constitute a new form of inequality which has previously been disregarded. Even though one might qualify this as a weaker form of disadvantage than being excluded from education permanently, it should not be ignored.

The illustration in figure 3.4.2 at the outset of the chapter showed that reducing early inequality would make later corrections irrelevant. Opening second chances leads to a new form of differentiation into different timing patterns of the way to higher education. The leverage inequality in re-enrollment has on this differentiation in educational career patterns depends on the inequality in first transitions.

Empirically, I showed that openness and flexibility of education systems not only result in less standardized individual patterns, but beyond that also in more class-inequality in these patterns. Even though the re-enrollment rates of lower classes are smaller, their higher exit rates out of the direct educational career pathway in the beginning result in a less direct pathway to their educational degree.

One might qualify getting postsecondary education later as a smaller disadvantage than the alternative situation of not getting postsecondary education at all. This normative question cannot be resolved empirically and is therefore not of much interest for a discussion. What can be discussed empirically is the contribution of this form of inequality to intergenerational class inequality. There are several ways how non-standard educational patterns can act in that way: late students can fare worse in school, e.g. have lower grades or lower chances of degree completion, or

they can have disadvantages (or advantages) upon labor market entry. Section 5 will follow on later by empirically looking at the labor market entry stage and also refer to results from the literature on the performance within education.

Evaluating the strategy of open access for re-entrants into the postsecondary or tertiary education system on the macro- or system-level would be highly policy-relevant. To do so, more information would be needed. One would have to answer the counterfactual question whether young adults delay their education under this condition on the system-level. Delaying could be a consequence of second chances, and the open and flexible education systems would invite students to not enroll in the first place. Then, one can expect that a part of the 'delayers' or 'interrupters' would 'cool-out' (Clark, 1960) and never return to school. And, as described within this chapter, another group would become late- or non-tranditional students instead of early students. Whether or not this can be balanced by those young adults who – due to the flexible system – revise their earlier decision against enrolling cannot be answered yet. An evaluation of the Bologna reforms could serve as a good basis for answering this question in the future. Furthermore, it is important to know in how far upper secondary graduates revise their decisions at all over time, or if early plans govern most of the patterns observed later. With this knowledge at hand we could get a better understanding of how likely the scenarios discussed above are.

This last point again returns to the question, how individuals decide: are gaps in the educational career a product of a delay, or of a decision to leave education which is later revised. The entire book until here had to rely on assumptions about this question. For the German case I will study this question in chapter 4.1.

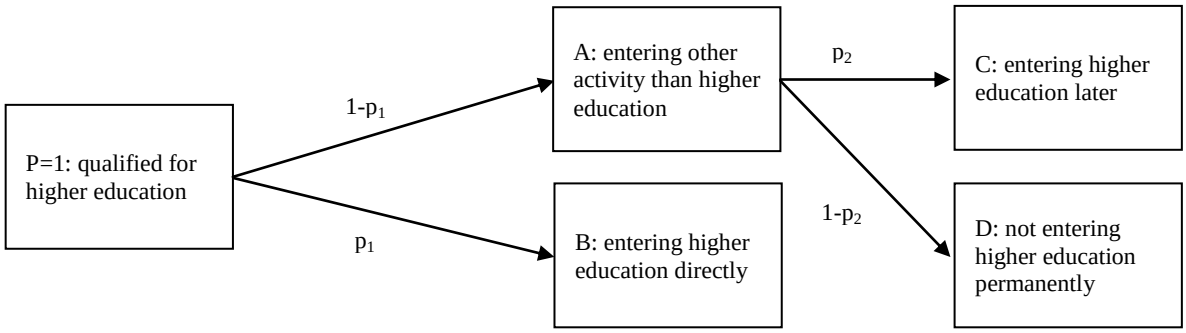
Against the results of all of the comparative chapters so far, the question about explanations on the micro-level becomes more and more important for drawing informed conclusions on the system level. The last paragraph is a good example: the underlying timing patterns of decisions are still unresolved but might have great impact on the macro-level conclusions. Other aspects which are closely related to the education system are important as well, such as costs of education. Section 4 now comprises a number of single studies on these micro-processes. Even though not all aspects can be enlightened, I discuss and test a number of theoretical explanations. Their selection is informed by previous research on educational inequality, but also on the previous sections on comparative research. Out of the previous comparative

chapters, a number of relevant questions on the individual level emerged. Answering them can then in a next stage hopefully improve further studies on the system level.

3.4.6 Appendix: An Illustration of Flows and Populations in the Generation of Inequality in Patterns of Educational Careers

This Appendix gives a short illustration of the discussion at the outset of this chapter, but in a somewhat more formal manner. On the one hand, the relation seems trivial, but similar problems are frequent in the social sciences and the difference between inequality in entry probabilities and inequality within populations is often neglected in discussions. One example is the debate on a quota for female CEO´s, researchers, professors etc.: depending on the existing inequality in the population, it would need an intake of female group members for quite a long period to adjust the inequality within the population only to a small degree. Therefore, it seems important to give a short illustration how the different probabilities depend on each other.

Figure 3.4.7: Transition tree: direct and indirect entry into higher education.



Be

- p_1 the probability of a transfer into higher education right after qualifying for it and
- p_2 the probability of a re-entry into higher education among those who did not transfer directly;
- p_1 and p_2 are independent from each other;
- then $1\text{-}p_1$ defines the risk for becoming a re-entrant.
- The size of the population P equals 1.

Inequality in the transition rates p_1 and p_2 was the concern of chapters 3.2 and 3.3. What makes the relation of inequality in these transitions and inequality standardization of life-courses among the full population difficult to follow intuitively is that they are connected via two multiplicative steps.

Population B is then given as

$$B = 1 * p_1$$

and C as

$$C = 1 * (1 - p_1) * p_2$$

Inequality beyond access probabilities in the pathways through the entire system does now refer to all those who access, i.e. the share of sub-population C among all entrants into higher education, which consist of the two sub-populations C and B. Thus, $C/(C+B)$ can serve as strongly simplified measure for de-standardization of educational career patterns for a given population P.

While the size of group B only depends on p_1, C is the outcome of two transitions and hence depends on both p_1 and p_2, and not only on p_2. The re-enrollment decision is defined as p_2 only, but inequality in $C/(C+B)$ always depends on p_1 too. Thus, even if the condition applies that

$$p_{2(service\ classes)} > p_{2(working\ classes)}$$

it can still be the case that

of $(C/(C+B))_{Service\ Classes} > (C/(C+B))_{Working\ Classes}$.

or inequality in the patterns of educational careers towards higher education, defined as

$(C/(C+B))_{Service\ Classes} - (C/(C+B))_{Working\ Classes}$.

is positive.
Intuitively, this is more likely to be the case, the larger $B_{(service)}$ gets or the smaller $B_{(working)}$ gets, since B is the sub-population which only occurs in the denominator. Reconsider now that $B = 1 * p_1$ and is therefore completely independent from p_2.

For any given population, i.e. the all students or subgroups such as those defined by class of origin, the dependence between rates and 'de-standardization' can be expressed as

$$\frac{C}{(B+C)} = \frac{(1-p_1)p_2}{p_1 + ((1-p_1)p_2)}$$

which can be transferred into

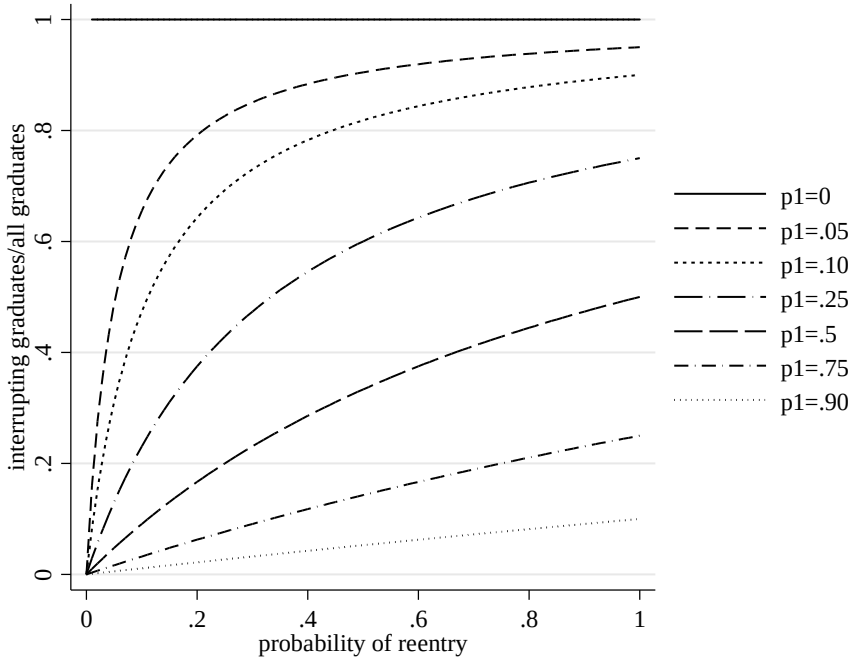
$$\frac{C}{(B+C)} = \frac{(p_2 - p_1 p_2)}{(p_1 + p_2 - p_1 p_2)}.$$

and shows that both C and B+C inevitably depend on p_1 and p_2 simultaneously. Furthermore, due to the multiplicative interrelation between rates and the groups B and C, there is linear relation between the two de-standardization and re-enrollment rates. Figure 3.4.8 illustrates how $\frac{C}{(B+C)}$ depends on p_2 at given values of p_1.

Each line depicts the relation between the share of interrupting graduates among all graduates, i.e. the extend of differentiation of higher education careers by patterns, on the one hand (y-axis) and the probability of re-entry on the other hand (x-axis). This illustrates that

- the impact re-entries have on interruptions depends on the number of direct transfers; the leverage of re-entries on differentiation in patterns is greater when p1 is small;
- the curvature is higher when p_1 is small. This implies that when p_1 is small, any re-entrant will already define inequality in patterns. If p_1 is large, the impact of re-entry on inequality is growing linearly with a growth in the probability of re-enrollment.

Figure 3.4.8: De-standardization by interruptions in educational careers and their dependence on the re-enrollment rate.



Values can be defined in Stata as follows:

```
drop _all
set obs 101
gen p2=.
foreach p1 in 0 .05 .10 .25 .5 .75 .90 1{
      di " "
      di " "
      local p100=`p1'*100
      gen x`p100'=.
      di "p1=`p1'"
      foreach p2 of numlist 0(.01)1{
            replace p2=`p2' if _n>100*(`p2')
            di "p2=`p2'"
            di (`p2'-`p1'*`p2')/(`p1'+(`p2'-`p1'*`p2'))
            replace x`p100'= (`p2'-`p1'*`p2')/(`p1'+(`p2'-`p1'*`p2')) ///
             if _n>100*(`p2')
            lab var x`p100' "p1=`p1'"
      }
}
```

Figure 3.4.8 shows how the share of interrupting students in a given group depends on p_1 and p_2, as discussed before, and how the contribution of p_2 depends on p_1: the higher the share of students transferring directly to higher education, the lower the dependence of $C/(C+B)$ on the probability of re-entering higher education.

For a given set values for $p_{1(service)}$, $p_{2(service)}$, $p_{1(working)}$, we can easily calculate the hypothetical value x for p_2 at which equalization or a certain level of inequality would be achieved when solving

$$(1/(C+B))_{Service\ Classes} - (1/(C+B))_{Working\ Classes\ =\ x}$$

Or, re-formulated and expressed in probabilities for transitions

$$(p_{1\,Service} + p_{2\,Service} - p_{1\,Service}p_{2\,Service}) - (p_{1\,working} + p_{2\,working} - p_{1\,working}p_{2\,working}) = x$$

for x=0 meaning equalization. This exercise is helpful to realize the small leverage that second chances may have on an overall equalization of social inequality.

4 SOCIAL INEQUALITY IN POSTSECONDARY EDUCATIONAL CAREERS – THE INDIVIDUAL PERSPECTIVE

Within this section, five single chapters are subsumed which all aim at further enlightening the micro-process of re-entry into postsecondary education over the life course. I start out with a summary of relevant theoretical concepts in chapter 4.0. Chapter 4.1 then analyses the timing of decision making for the German context. Within chapters 4.2 and 4.3 I test an implication derived from one mechanism for the explanation of educational social origin – the relative status hypothesis. While chapter 4.2 refers to the US context only, chapter 4.3 compares the US and Sweden. Chapter 4.4 takes a closer look at the operationalization of parental class and asks who out of both parents has a stronger influence on their sons and daughters late schooling behavior in the US. Finally, in chapter 4.5 I seek to explain why working class daughters to re-enroll more often than their upper-class peers.

In the previous sections 2 and 3, country differences were the central interest which was motivated by the aim of comparing structural conditions. Within this comparison, I made assumptions about decisions on the individual level, but neither linked them back to the recent discussion on educational decision making, nor explicitly tested them. Implicitly, it has become clear at several instances that the assumptions about the behavior on the micro-level have the potential of both affecting the results and of changing the interpretation of late schooling with regard to its contribution to social inequality. For the comparison, I have relied on strongly simplified assumptions on the micro-level. This might overlook several aspects. In order to improve the basis for comparative work, the micro-foundations of inequality in late education should be understood better. This chapter comprises several articles for deepening the

understanding of these processes at the micro-level, which are not comparative. Beyond, chapter 4.3 makes one step further and uses findings on the micro-level for refining comparative analysis.

This section aims at addressing a number of questions related to the decision making of individuals, leading to different postsecondary educational career patterns and to contribute to some more detailed questions. It does not aim at encompassing all aspects of the emergence of individual decision making. First, the 'when and why' of decisions about participation in schooling has far-reaching consequences that I have discussed at several instances already, but never tested empirically. Second, the question of how social origin might lead to social origin differences in educational decisions even in adulthood – and how long this influence of the parental background can persist. And finally, some reactions on certain institutional details, which do not fit the broad framework but rather explicit policies, could help to link the findings back on the aggregate level.

Chapter 4.1 will empirically assess the question of 'myopia', i.e. of the timing of postsecondary (re-)entry decisions. In other words, the distinction between the 'ad hoc'-decision to re-enroll vs. the intended planning of educational career sequences including a delay. I scrutinize the social origin differences in the time of decision making and its persistence is enrollment in higher education in Germany following the completion of vocational training. The dataset used also allows testing several hypotheses on mechanisms explaining the delay or re-entry.

In chapter 4.2 I test one specific explaining mechanism – the hypothesis that families prioritize the reproduction of parental status ahead of upward mobility (Breen and Goldthorpe, 1997; Erikson and Jonsson, 1996a) – leading to expect inequality in re-enrollment. The situation in the US, where a comparatively high share of young adults enters the labor market before studies, allows observing whether these young adults react with additional educational attainment on falling behind their parents' social class. This complements the known tests for this mechanism (often referred to as 'relative risk aversion' of families) by a study based on the observation of 'real' relative status demolition.

In chapter 4.3 go beyond a pure micro-level perspective and present a study comparing Sweden and the US. However, other than in the previous sections where describing and explaining the results of institutions was the main aim, I now use the comparison of two similar education systems to test how individual react on different

restrictions on the micro level. This serves on the one side at strengthening the results from chapter 4.2 and comparing the role of the relative status maintenance motive over societies. On the other hand, the chapter uncovers other factors leading to re-enrollment in the different societies which might trace back to the different costs of education in the two otherwise similar contexts.

Chapter 4.4 takes a life course perspective and combines two questions. First, I ask about the different roles of mother´s and father´s class for the late enrollment of sons and daughters into college education in the US. This serves the purpose to test the accuracy of several hypotheses on the sex typing of the transmission of social inequality from one generation to the next. It turns out that among women inequality in attending college changes indeed over life course. While among the disadvantage of lower class offspring is stable, lower class women compensate for their early disadvantage somewhat by a higher enrollment rate at later stages of their biography. I test a number of explanations which could potentially explain this particularity in the second part chapter 4.4. To broad categories of explanations might be distinguished: time constant factors fuelling a particular late schooling entry of women from lower class backgrounds on the one hand; and typical events and changing environmental conditions, opportunities and restrictions of individual life courses of these women on the other hand.

4.0 Explaining Class Inequality in Educational Transitions – The Case of Education in Adulthood

The number of hypotheses about the social selectivity of educational decisions is numerous, while a single predominating factor could not be identified by the research efforts of the past decades[22]. With regard to delays and re-enrollment decisions, several new challenges emerge. Not only is the question for how long decisions are made, i.e. how long actors' time horizon is and how persistent they are in following their intentions. Compared to the educational decisions occurring earlier in the biography, different actors are involved for postsecondary education. While the parents decide solely about the earliest educational attainment, the responsibility is gradually shifted to the child over time. Parents might still be involved, but we can expect the children to become more and more independent. When and on which aspects parents or children have discretion can only be assumed – but those educational decisions which are met after an initial phase of work (and thus with own income) should generally be made most independently by children. Furthermore, the contexts framing the decision change over time. Factors which are stable over time, such as social reference groups, wealth or cognitive development might change the parameters triggering the one or the other decision. Many of these changes can be related to events in other life course domains, e.g. marriage or the death of parents.

Why are Individual Level Explanations Important for Explaining Social Phenomena?

Why talking about individual behavior, if structural conditions are the main interest? Investigating individuals' decision making is also motivated in its own interest. However, beyond that, in the long run the aim is to inform and improve explanations of macro phenomena. In order to structure sociological explanations, several authors[23] suggested applying a macro-micro-macro schema where the relationship between collective phenomena is explained via three steps (Esser, 1999, Chapter 6): First, the

[22] For an overview, see Erikson and Jonsson (1996a).
[23] Most prominent in the English language literature is the work of Coleman (1990). For an extensive list on other authors suggesting a similar structure of sociological explanations see footnote 3 on p. 98 in Esser (1999).

social situation and its impact on individuals. 'Bridge hypotheses' (Esser, 1999, p. 120) are developed on the conditioning of contextual, societal circumstances on individual behavior. Second, the individual selection according to given rules out of the set of choices they have. And third, the aggregation of individual choices to societal outcomes. As a blueprint for explaning social inequalities in educational participation, this schema is useful, both for structuring the discussion of explanations for social origin effects as well as explanations for country differences. Social origin differences define the context, as well as the country level. Within these conditions individuals decide about their education. In particular in policy-oriented comparative research, the link between the micro- and the macro-level are often not discussed explicitly.

For comparative research, knowing the micro-processes is of great relevance for developing sound hypotheses on the macro-level. Wouldn't there be any individual reaction on structural conditions these conditions would not change social realities. Knowing the processes of individual decision making will thus lead to more realistic assumptions and therefore also improve macro-explanations. However, psychological processes on the individual level can be very complex. Strong simplifications are needed for not arriving at very complex explanations. The challenge is thus to capture the broad lines of individual decision making in a parsimonious way. This trade-off, I argue, justifies that I have first investigated institutional research questions with strongly simplified assumptions on individual behavior. And that I now, after the first step, investigate the mechanisms of the generation of inequality on the micro-level.

Why Keeping the Focus on the Contextual Level?

In the course of this process, one might in the end find mechanisms such as genetic inheritance that are indeed truly individual and not contextual. However, in particular comparative studies and existing difference in educational outcomes or inequality show that context matters without any doubt. Research on the contribution of contexts should thus not allow being distracted by individualistic explanations. The rule of parsimony on the individual level is a helpful tool to avoid this trap: simple, general approximations for individual behavior should be searched, to be able to focus on contextual effects as the main interest. The motivation to focus on contextual effects

and treat individual explanations broadly can be manifold – and mirrors the free choice of the researcher rather than following empirical or theoretical imposition. Choosing a research question according to its contribution to a normative debate on equalization of opportunities can serve as a strong motivation to ask for the impact of institutional conditions. While the purely individualistic and context-independent part of the causes might exist, their only implication for policies might be to suggest inactivity. Finding out 'what can be done' on the other hand needs knowledge on the contextual, institutional conditions. Individual level explanations discussed in the following will be selected by the aim of parsimony for explanations of individual behavior and by the connectivity to institutional research. While not claiming to document the full spectrum of reasons for non-participation in higher education of lower-class children, I discuss a number of explanations in the following to which previous studies have referred chosen on this criterion. Other mechanisms which may contribute less to understanding institutional differences, such as genetic inheritance of cognitive ability[24], will be left out. The mechanisms I consider can be categorized in four groups. First, investment into education (Breen and Goldthorpe, 1997) in order to *maintain the family status.* Second, being (or perceiving to be) restricted in choice due to *financial resources* or *credit constraints.* Third, the *perceived probability of success* in higher education. And fourth, lower performance ('*primary effects*') in the school-leaving exam at upper secondary school (Boudon, 1974). Beyond that, I will tackle the question of timing of individual decision making.

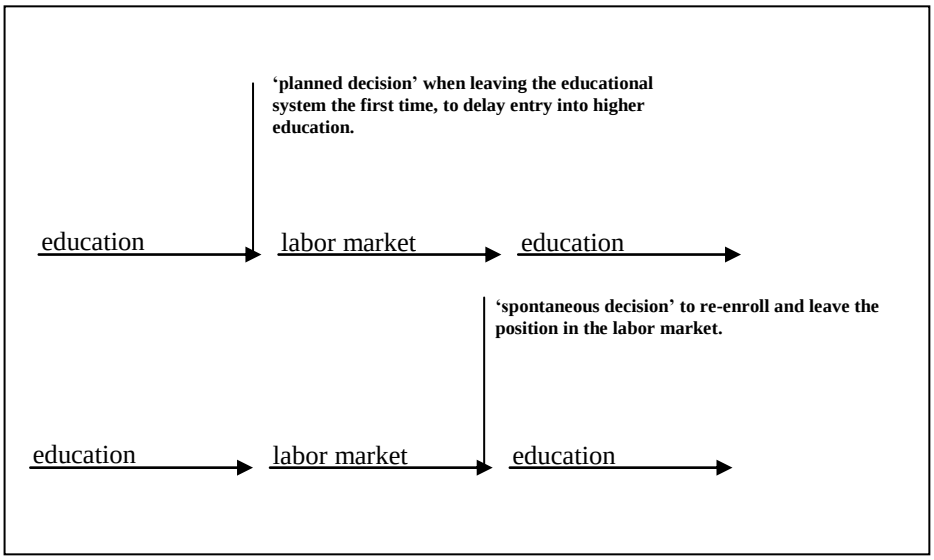
4.0.1 When do Young Adults Decide about Enrollment?

The timing question appeared already in many instances in this volume before. With regard to institutional hypotheses, this belongs to the most important aspects of individual decision making. Only if it is known when decisions are made, the institutional conditions of the decision can be ascertained. As an example, if it would be known that all late enrollment decisions are made immediately at the time of re-enrollment, more situational factors and experiences in the labor market or financial constraints should trigger belated educational attainment. If this is not the case and young adults plan well ahead that they will merely work for a while and later re-enter,

[24] For a recent review on the contribution of this mechanism to inheritance of social positions and income see Black, Devereux and Salvanes (2008).

it might be more fruitful to search for reasons why they refrain from immediate enrollment in the given country context. It is these two ideal-typical situations that can be distinguished for the timing question. The two modes are depicted in figure 4.0.1. In reality, other or mixed forms might occur.

Figure 4.0.1: Modes of decision making resulting in re-enrollment in education after a first school-to-work transition.



In several instances I called the first mode of decision the 'ad hoc decision' or the 'assumption of myopia'. It requires, that the decision to leave the educational system and enter full-time employment antedate. The second decision mode I call the 'planned decision'. In this case, at the labor market entry it is already anticipated that there will be a re-entry into the educational system.

4.0.2 Social Origin and Scholastic Performance

A well-established classification of mechanisms explaining social inequality in educational achievement is the distinction of 'primary' and 'secondary' effects of social origin in education (Boudon, 1974). Even though not exactly described in that way by Boudon, primary effects are in most studies defined as social origin differences in (school) performance leading to different educational outcomes (e.g. Jackson, forthcoming; Jackson et al., 2007; Schindler and Reimer, 2010). Secondary effects are attributed to class specific decisions, and are measured net of performance

differences between classes. As popular as the concept has been in empirical research in the recent years, it is controversial how substantive such a classification of mechanisms is as an explanation[25]. There is further a certain danger that performance based differences are interpreted as being meritocratic, which is a problematic and in many respects inappropriate interpretation (cf. Goldthorpe, 1996). However, even though the classification of different mechanisms cannot be sufficient as an explanation for social inequality, the discussion has rightly highlighted the importance of performance differences between classes of origin. Implicitly, this also highlights the importance of taking the previous educational biography into account.

Performance differences can both affect delays and ad hoc re-entries. For the case of delays, straightforward hypotheses depend on the higher education system. *Numerus clauses* regulations can hinder immediate enrollment and a delay of the intention to enroll. Later enrollment will then occur as soon as a place in the preferred study program is available. Furthermore, e.g. in the German case, there used to be a regulation allowing preferred access for students with 'waiting time' spend in apprenticeship training. But the more likely impact of primary effects is if young adults decide ad hoc on re-enrollment into higher education. The mechanisms are the same as for early entrants. First, admission can be denied when entrance regulations use school marks as entry criterion. Second, poor scholastic performance can discourage young adults from re-enrollment due to lower expectations about the probability of completing higher education successfully.

4.0.3 Status Maintenance

The *status maintenance* argument is based on the assumption that decision makers in principle make rational decisions about investment in education. At the same time the argument, however, relaxes this assumption and introduces the motivation of families to achieve at least the same social position for their offspring as they have themselves *('relative risk aversion').* This preference implies that failure in achieving at least the parental status would be evaluated as a larger loss than forgone benefits from not

[25] Nash (2003; 2006) has criticized the static nature of the separation of the effects. It is highly intuitive that performance effects in one single transition can be caused by earlier decisions. Social origin differences in the entrance to university can be explained to a certain degree by different grades in upper secondary school leaving exams (Schindler and Reimer, 2010). However, these grades could easily be the results of earlier decisions of parents, e.g. if they provide private tutoring. Moreover, later transitions can depend on earlier grades as grades indicate abilities to decision makers (Breen and Goldthorpe, 1997; Erikson and Jonsson, 1996a). Then, performance and decisions get mixed.

achieving upward mobility (Boudon, 1974; Breen and Goldthorpe, 1997). Therefore upper-class families will invest more in education in order to avoid downward mobility.

Children with a higher educational background can see late enrollment as a chance to overcome intergenerational status demolition if they did not enroll right after leaving secondary education for any reason. Therefore, a change in educational intentions can be expected to intensify existing educational inequalities further. Late enrollment thus offers a second chance to avoid status demolition. Re-enrollment after status demolition therefore is an interesting test case for the model, which can go beyond previous test of this mechanism (Breen and Yaish, 2006; Davies, Heinesen and Holm, 2002; Gabay-Egozi, Shavit and Yaish, 2009; Holm and Jæger, 2008; Stocké, 2007; van de Werfhorst and Hofstede, 2007) by directly measuring status demolition, which all find at best small contributions of the relative risk aversion to explaining educational inequality.

The model remains silent on the question of inequality in delaying entry into higher education. In order to reproduce the family status, the important factor is the decision to invest in a sufficient level of education – and not so much its timing. Delaying enrollment might also delay the successful reproduction of the parental status, but does not jeopardize this aim. Any time pattern that is most efficient to achieve an educational ambition or opens gateways for upward mobility would be alright. If any, working class should be more willing to delay, e.g. to implement a safety net by getting vocational training before enrolling in higher education (Becker and Hecken, 2009a; Büchel and Helberger, 1995; Hillmert and Jacob, 2003). Applying the status reproduction mechanism on this specific form of delay in the German context one would expect that school-leavers from a lower class background more often choose such an 'insurance strategy'. Service-class children inevitably have to achieve higher education. All alternatives would most likely lead to 'failure' in achieving parental status. Completing vocational training as insurance against failure in higher education would not have any value for those coming from higher social class-background. In contrast, working-class students are able to achieve parental status via vocational training. Outside the German context with its strong vocational education system, the insurance strategy is very unlikely to motivate delays. Or at least one would have to make additional assumption for arguing in these lines. E.g. if we assume that families with higher class backgrounds are afraid of the known

'cooling out' function of lower tracks and working experience, and thus would see a threat to their status maintenance in the delays. Then, they would avoid delaying higher education.

4.0.4 Financial Resources and Direct Costs of Higher Education

After graduation from upper secondary education, young adults from lower-class families might not have enough resources to finance higher education or might want to earn their own money as soon as possible. Either a real lack of financial resources or the missing willingness of lower-class parents to invest in their child's education could lead to this situation. Opportunity costs from forgone labor market earnings are another important cost-component which varies especially with labor market policies. Its influence was already discussed in chapter 3.1 and 3.2. Here, I will only refer to direct costs.

With regard to re-entry, an increase in wealth from labor income should change young adults' opportunities and help working-class children to catch up in educational achievement through re-entry into higher education. Hence, if this explanation holds good, we can expect a higher potential of changes towards participation in higher education for children from a lower educational background and also higher re-enrollment rates among those who initially did not intend to study. The costs of higher education depend to a large degree on the context. For Germany, where there existed no tuition fees for the group I study and students from poor families can get means-tested support for their studies, we cannot expect that this mechanism applies.

Costs or perceived costs are reported by lower class students to be a major obstacle for not enrolling (Schindler and Reimer, 2011) and can impose stop-outs by poorer students (DesJardins and McCall, 2010). In order to solve the problem of a lack in financial resources, the strategy to delay higher education is one possibility. After some time of work, young adults can amass savings to cover the costs for higher education – while other factors might then prevent them from enrollment. Direct financial costs can thus not be ignored as an important explanation for delays in higher education. In system comparison, this would lead to expect more interrupted higher education careers in Sweden than in the US – where costs are highest. At the same time, inequality in the delay of higher education should grow whenever the costs

of higher education are increased. On the contrary, low income-inequality and growing wealth has to lead to lower educational inequality directly.

For ad hoc decisions to re-enroll, costs can matter as well, even though the link between available material resources and social origin can be assumed to decline over time. Young adults from less wealthy families will be less often able to mobilize parental resources to cover the costs also of later education. In particular if late educational programs are private funded, such a MBA-programs where social origin difference are known to be high (Mullen, Goyette and Soares, 2003). If schooling is provided by the state on the other hand, this factor could lead to new social inequalities.

4.0.5 Perceived Probability of Success

The *perceived probability of success* is also known to vary with parental education. Young adults with lower educational background might perceive their risk of failing in higher education as higher than those young adults with a higher educational background. As e.g. Archer and Yamashita (2003) find in a qualitative study, working-class students claim often to 'know their limits' or do not 'feel good enough' for higher education. This could lead to the intention to enter less demanding educational tracks. Furthermore, it could be a motivation to implement a 'safety net' in case of failure in higher education. We can therefore expect children from less educated families to obtain vocational training more often before entering tertiary education (Hillmert and Jacob, 2003). The achievement of vocational training before starting higher education can reduce the risk of entering the labor market without any completed degree (which is problematic in Germany). On the other hand, if upper secondary graduates leave the educational system without plans to re-enter, they can change their minds and develop the intention to enroll. Oettinger (1993) proposes that this occurs due to changes in the perceived probability of success during one's lifetime.

According to his hypothesis, less confident young adults with lower grades in secondary school learn about their abilities through experiences in the labor market. Consequently they gain more confidence about their own educational success and re-enroll more often. For re-entries, this leads to an expectation contradicting the

implications all other mechanisms: inequality should reverse and the lower origin youth would catch up over time.

Developing a hypothesis on the delay of enrollment on basis of this mechanism is not straightforward. Expecting a low probability of success in higher education at time t should not lead into a delay of enrollment until t+x. The probability of success at any later time is the a priori the same, but at later time enrollment an additional uncertainty has to be added in comparison to immediate enrollment since the prediction of success based on past achievement should be less precise. Therefore, based on this mechanism, inequality in the delay of entry into higher education should be absent.

4.1 Timing and Persistence of Postsecondary Educational Career Intentions by Social Origin

This chapter goes beyond the observed patterns of educational attainment and asks for social origin differences in the realization of educational intentions being reported at the time of qualifying for higher education in Germany. In general, the reported plans are found to be highly persistent. However, effects of parental education on the changes of educational intentions increase the existing social inequality in the participation in higher education. This can be explained partly by previous educational performance. In conclusion, while both delays and re-enrollments occur and are sensitive for social origin, inequality already manifests to the largest part at the time of graduation from upper secondary school.

The chapter is a revised version of the following article:

- Weiss, Felix and Hanna-Marei Steininger, 2012: Educational family background and the realisation of educational career intentions: participation of German upper secondary graduates in higher education over time. *Higher Education.* Online First.

From the first chapter on, I have repeatedly argued that information about the timing and the process of educational decisions is necessary for developing sociological explanations of inequality in educational decisions. As long as the conditions for actors are constant over time, the timing of decisions is not important. However, when a sequence of more than one decision shall be explained timing matters, in particular during youth when social contexts change rapidly. Most previous studies have relied on assumptions. One example within the sociology of education is the widespread continuation ratio model (Mare, 1980) that implicitly assumes that actors are short sighted and decide from transition to transition independently. In their critic on the approach of continuation ratio models Cameron and Heckman (1998) have highlighted that the assumption of myopia could be violated. The discussion at the outset of both section 2 and 3 have already highlighted the far reaching consequences for the interpretation of the assumption on the timing of decisions. While Cameron and Heckman criticize the research tradition of ‘educational transition research’ and suggest alternative statistical modeling, the empirical question of the decision making

process on postsecondary education of individuals remains unresolved. There exists, however, literature that has dealt with ‘ambitions’ and ‘aspirations’ over time.

One study dealing with the change of educational intentions over time has been conducted by Brint and Karabel (1989) for the US. The authors confirm Clark’s ‘cooling out’-hypothesis of educational ambition over time for the context of Community Colleges (Clark, 1960). Other studies for the US have as well shown that declines in the expectation to complete higher education are more frequent among young adults from lower material background (Bozick and DeLuca, 2005) or that parental socioeconomic-status affects educational attainment even among highly motivate and able students (Trusty, 2001; Trusty and Harris, 1999). Also among students with lower achievement, lower SES students had high abstract, but to a lesser degree concrete educational expectations which they realized less often than high SES students (Trusty and Niles, 2004). A cooling out for disadvantaged youth with regard to attendance patterns over time was also found by Alexander et al. (2008). Outwith the US-literature, studies on the process of cooling out are rare. The absence of research for the context of postsecondary education in Germany is surprising. Even though interruptions in educational careers less frequent than in the US (see section 2 of this volume), the frequent occurrence of completing both vocational training and higher education could invoke exactly the same process as the community colleges in the American context.

This chapter examines the cooling out-hypothesis for the case of Germany. While the US-research has mainly focused the expectation to make it to the four year college or complete a degree, the decision that German upper secondary graduates have to make has a much more voluntary character since costs for higher education are much lower in Germany. Therefore, instead of expectations or the less frequently used term ‘plans’ (Rosenbaum, 1980), I will refer to intentions. Beyond describing how intentions result in educational attainment when students plan their educational career ahead of time, this chapter addresses the question in how far parental education is influences this process. This is a particularly interesting question for those students who delay their entry into higher education, since they have more time to lose their ambitions to study. Hence, several of my hypotheses refer to those students who did not enter higher education immediately after qualifying for tertiary education. Following their biography, I will assess whether they enter higher education later or not.

Chapter 1.4 at the beginning of this volume describes the German education system. The phenomenon of young adults choosing vocational training instead of higher education is widespread. Besides tertiary education, vocational schooling and especially apprenticeship training are relevant alternatives for upper secondary graduates. Apprenticeships consist of in-company training, complemented by part-time vocational schooling. Completing an apprenticeship typically takes 2 to 3 years. Thereafter, a considerable number of graduates enroll in tertiary education (Jacob, 2004).

In a second step I ask whether these changes are due to mechanisms that are known from established explanations of educational inequality. Beyond establishing an explanation for changes in educational intentions over time, the relevance of this endeavor also derives from a methodological issue. Since educational intentions are sometimes used as an approximation of educational decisions in studies assessing educational inequality (e.g. Becker and Hecken, 2009a; Becker and Hecken, 2009b; Heine, Quast and Beuße, 2010; Heine, Spangenberg and Sommer, 2006), it is important to know about the relationship between both. Testing the persistence of plans allows evaluating the impact of this practice on the findings of previous studies.

The results show that educational intentions are in most cases realized. Children from families with a lower educational background are less motivated to enter higher education. Careers that are inconsistent with previous intentions tend to show more conformity with parental educational achievement, irrespective of the intentions the young adults initially had.

4.1.1 Hypotheses

At the outset of this section I have discussed four mechanisms being frequently put forward when explaining educational inequality. Not all of them contradict in their prediction of inequality in the stability and re-formulation of educational intentions. However, there are differences in whether a cooling out of the aspiration for higher education must be expected when attending a vocational training program or if lower classes develop towards participation in higher education over time.

The cooling out hypothesis as well as a persistently low participation of lower class children over the life course can be backed by several arguments. The status maintenance motive of families is the most straightforward mechanisms clear

for this prediction: young adults from lower social backgrounds will have reached their parents status with vocational training and thus less often change their plans towards higher education. Upper class children on the other hand can see late enrollment as a chance to overcome intergenerational status demolition. Therefore, a change in educational intentions can be expected to further intensify existing educational inequalities. The same hypothesis can be derived from the claims that either costs or lower performance hinders children from lower social origins to enroll in higher education – when assuming that the lack of these resources remains persistent over time. If – however – these resources are increased over time, revisions in educational expectations more often occur among previously deprived working-class children. A resource which is unlikely to change over time is the individual perception of performance. When assuming that these perceptions are formed by young adults according to their grades from secondary school, one would expect a stable disadvantage of children from lower class backgrounds.

On the other hand, it can also be hypothesized that after completing vocational training lower class children are more likely to enroll in higher education and catch up somewhat with the privileged since their situation changed. E.g. since the availability or the value of their resources has improved. For financial resources this is very likely to be the case, since the young adults become more and more independent from their parents financial support and amass their own savings from labor market income. However, since there were no tuition fees in Germany for the group I study and students from poor families can get means-tested support for their studies, I do not expect this mechanism to be a major explanation for social differences in the change of educational intentions. For the primary effects, i.e. differences in performance in secondary school between children of different social origins, a similar scenario is possible. The numerus clausus system in Germany used to have a ‘rule of compensation’ for lower grades. In some programs, the time spent involved in other activities permits access regardless of grades. Then, the disadvantage in access to higher education due to a lower GPA decreases over time. However, there is no guarantee for admission via this rule, so the grades remain important to some extent. Even the perceived probability of success may increase, if it is not derived from GPA but from practical experience in the labor market or life experience, as Oettinger (1993) proposes. According to his hypothesis, less confident young adults with lower grades in secondary school learn about their abilities through

experiences in the labor market. Consequently they gain more confidence about their own educational success and then enroll more often.

In order to distinguish between the mechanisms that could drive the existence of inequality in the revision of educational plans, I attempt estimating them directly using a set of variables which is included in the dataset. These variables are presented in table 4.1.1.

4.1.2 Data, variables and methods

The dataset used for this analysis differs from the datasets used for the previous chapters. The results are based on the 1999 HIS Panel Study of young adults qualified for higher education ('HIS Studienberechtigtenbefragung', Durrer and Heine, 2001), a mail survey in two panel waves. The first of these was conducted six months after leaving secondary school and the second wave three years later. The study covers educational career intentions in the first wave. In the second wave, retrospective information about the actual pattern of the educational and labor market career is collected. Parental educational achievement is measured, as well as a rich set of variables describing the previous educational achievement of the respondent, e.g. type of secondary schooling, school-leaving certificate and grades (GPA). As a limitation, the operationalization of parental social class is only possible in a reduced form and not comparable to the other datasets. I therefore refer to parental education instead for the following analysis. There are 7,374 respondents with completed records for both waves, but after intentionally excluding respondents who had completed an apprenticeship by the time the first wave was conducted[26] (560 cases) and cleaning the sample of missing values, only 5,893 cases are left for the analysis sample.

The interpretation of the results has to take into account the right-censoring of the data three and a half years after receiving an upper secondary degree. Although it is generally possible to finish a vocational degree and enter tertiary education in the observed time frame, young adults might often interrupt this sequence by working to earn money before starting higher education. In this case, enrollment could be later than the censoring date leading to an underestimation of the persistence of plans. In order to test the impact of the censoring of the data, I run the central analyses (discrete

[26] This group was excluded as they are in a completely different situation. To choose entering vocational education first is not a possible option. They would need to be analysed separately, which is not possible with the small number of these young adults in our sample.

time logistic regression models) again with the 1990 HIS Panel Study, an identical mail survey in three panel waves covering a period more than five years after leaving secondary school. This replication confirmed the results of the more recent survey.

The first step of the analysis describes inequality in educational plans. Educational origin differences in the intentions for a certain educational career in comparison to direct entry into tertiary education are to be expected given the known origin effects on participation in higher education. In a second step I evaluate the influence of parental education on the persistence of these intentions. Furthermore, I investigate whether the theoretical mechanisms discussed above can explain the effect of parental education on the change in educational intentions. The last analysis uses discrete time event history logistic regression models. In order to overcome the comparison problem of coefficients from binary choice regression models, I report y-standardized coefficients. Although this strategy helps somewhat, it is suboptimal with regard to model-comparison (Mood, 2010). Therefore, all models are estimated as linear probability models in addition. For each group with a certain educational intention there are three models:

- A model that shows the total effect of the academic education of mother and father.
- A model showing only the net 'secondary effects' of parental education, holding performance constant.
- A model that includes explanatory variables based on subjective indicators.

Primary effects of parental education (differences in scholastic performance) are measured based on the following characteristics of the school-leaving exam: type, grade point average (centralized in groups by federal state and type of degree), and the type of school. In order to correct for differences in the sample composition by correlates of socioeconomic status, the age and the sex of the respondent are kept constant. To rule out the possibility that cooling out is a function of participation in compulsory service I also control for participation in either military or civil service (only males), which lasted about one year in the cohort I study. The time spend in service is deleted from the process time in the event history models. This implies that the time during which respondents are in compulsory service is treated as if time had been stopped.

Table 4.1.1: Operationalization of theoretical constructs.

theoretical constructs	**question used for operationalization and *original version in German***
	'How relevant are the following reasons and motives for the choice of your post-school career?' *‚Welche Bedeutung haben die folgenden Gründe und Motive für den von Ihnen gewählten nachschulischen Werdegang?'*
status maintenance	- 'to achieve a high social status.' *-‚einen hohen sozialen Status erreichen.'* response possibilities: 1 (very important/sehr bedeutend) to 6 (irrelevant/bedeutungslos)
financial resources	- 'to be financially independent as soon as possible.' *-‚baldige finanzielle Unabhängigkeit.'* possible responses: 1 (very important/sehr bedeutend) to 6 (irrelevant /bedeutungslos) - ‚short duration of training.' *-‚kurze Ausbildungsdauer.'* possible responses: 1 (very important/sehr bedeutend) to 6 (irrelevant /bedeutungslos)
perceived probability of success	- 'I expected good career and income prospects.' *-‚meines Erachtens günstige Berufs- und Einkommenschancen.'* response possibilities: 1 (very important/sehr bedeutend) to 6 (irrelevant/ bedeutungslos) - 'it matches my performance.' *-‚gute Übereinstimmung mit der eigenen Leistungsfähigkeit.'* possible responses: 1 (very important/sehr bedeutend) to 6 (irrelevant/bedeutungslos)
'primary effects' of social origin (performance)	grade point average of school-leaving exam

Source: HIS Panel Study of young adults qualified for higher education questionnaire, 1999

Parental education as the central independent variable has three categories: 'both parents have completed higher education', 'at least one of the parents' has completed higher education' and 'neither of the parents' has completed higher education'. In table 1 I give an overview of the operationalization of the theoretical concepts from my hypotheses.

The retrospective nature of the questions about intentions is a methodological limitation. Students were interviewed half a year after becoming eligible for higher education, i.e. in most cases after completion of upper secondary school. Although one can assume that upper secondary graduates at a young age are able to recapitulate

this important decision, their answer could be biased towards their actual choice. I argue that this problem is less serious than it seems at first glance. First, I still find differences between the educational intention and the present enrollment status. Second, there is a considerable number of students for whom the first possible entry into higher education is still ahead, namely all (male) draftees (1,620 respondents in the analysis-sample). Military or civil service normally lasted roughly one year for this cohort. Although an analysis of the plans and persistence of male respondents in compulsory service showed that they differ somewhat in their educational career compared to male respondents who are not enlisted, the findings of table are confirmed for the draftees. I thus argue that the overall findings are unaffected by the retrospective nature of the survey.

4.1.3 Results

First, I describe the educational intentions and their realization, concentrating on the differences in intentions and their realization by parental education. Thereafter, the theoretical hypotheses are tested. I only present the results for the central variable, parental education. The full models are documented in the Appendix 4.1.4.

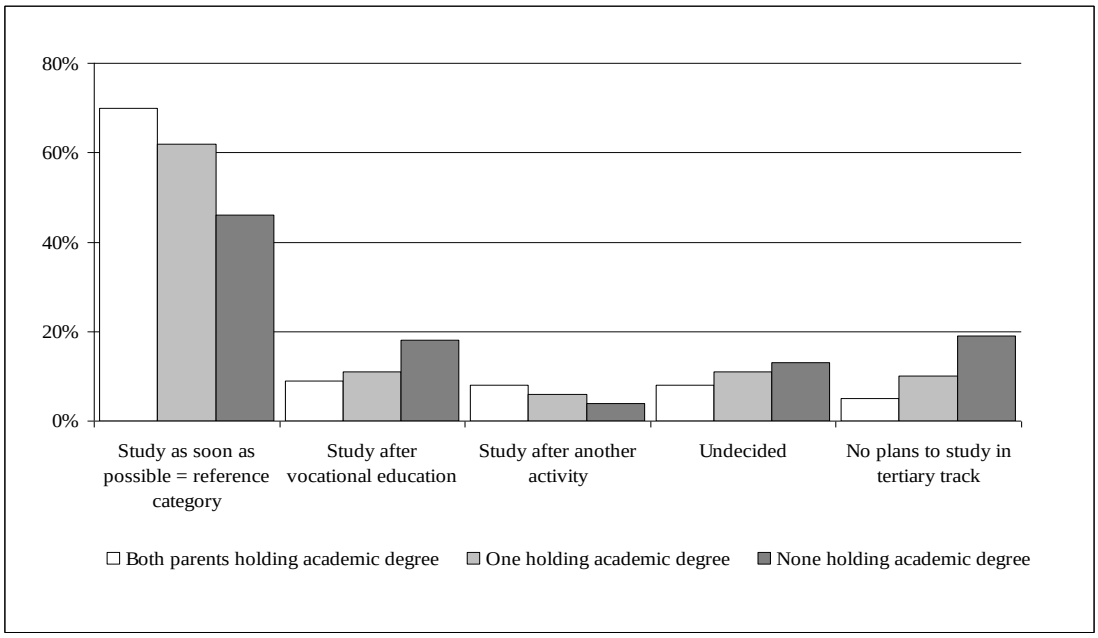
4.1.3.1 Parental education and educational intentions

Figure 2 gives an overview of the intentions of all young adults in the sample by parental education. In the upper part of the figure the group sizes are shown. The results are weighted with a weight provided by the data-collecting institute HIS to correct for possible sampling error. However, the weighted results are only slightly different from un-weighted results.

More than half of the sample intends to enter higher education immediately. Another 14 per cent would like to do so after vocational training. A minority of 11 per cent is undecided about their future, and 13 per cent report having no intention of entering higher education. The fact that such a high number of students intend to enter university raises the question where and at what time the intentions to do higher education ‘cool out’. With regard to parental education, figure 1 shows the number of respondents with a certain intention by parental degree. It clearly confirms previous findings that children from families with a lower educational background are less motivated to enter higher education. The sons and daughters of parents without a

higher education degree are more likely to intend 'higher education after vocational training' or 'no higher education at all'. Furthermore, they are more often undecided about their future. Interestingly, graduates whose parents both have higher education have the highest likelihood to expect to study after other activities, e.g. voluntary service.

Figure 4.1.1: Educational intentions by educational family background.



Source: HIS Panel Study of students entitled to higher education.
Own calculations. N=10580.

Apart from the fact that young adults with a lower educational background generally less often choose higher education, they also intend more often to delay their entry. This is even so if they intend to study at some time in the future. At the same time they are more often undecided.

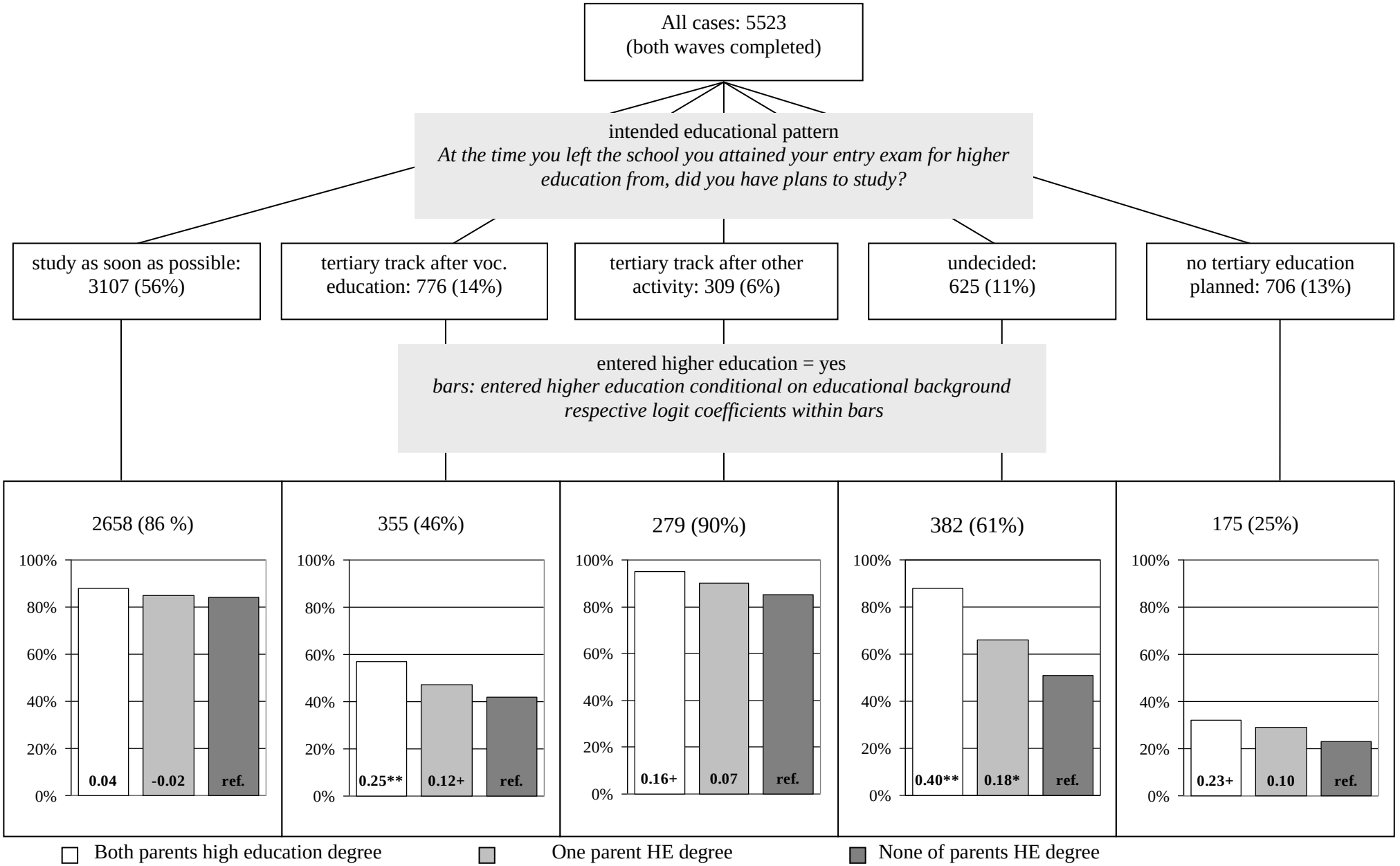
Now, I will turn to scrutinizing possible explanations for educational careers that are inconsistent with the initial intentions, focusing on the question of enrollment in tertiary education.

4.1.3.2 Parental education and the persistence of educational intentions

In the lower part of figure 2 the career intentions, the persistence of these intentions and the rate of students entering higher education are broken down by parental education. Within the bars, showing the higher education participation rates in

percentages, I also report the y-standardized coefficients of a (discrete time event history) logistic regression model with the dependent variable ‘entered higher education’ (1 = yes). These coefficients show the dependence of enrollment into higher education on educational background by intention.

Figure 4.1.2: Descriptive overview on transitions into education after achieving university entry qualification in our analysis sample.



There is a notable correspondence between participation in higher education and the intention to do so, with two exceptions. First, a re-entry after vocational training is less frequent than the students reporting that it was their intention. Second, among those who do not intend to enter higher education at all, approximately one fourth change their minds. Besides a possible 'cooling out' through apprenticeship training, the reason for the first exception could be right-censoring of the data. However, checks with other datasets suggest that this should not be the case. The second exception, those young adults who report no intention to enter higher education at all, is not surprising. The time horizon is, especially compared to those who intend to enter higher education immediately, much longer. The risk of a change in intentions is certainly higher if a person is observed over a longer period of time. Even if the risk might be the same at one moment in time, there will be more events if the observation period is longer.

The notably high persistence regarding the plan to study as soon as possible is even stronger among entrants into higher education at any point in time during the observation period. A surprisingly high share of more than 97 percent of the students does enroll. In the table only those respondents are defined as persistent who enrolled as soon as possible. Hence, the non-persistent respondents in this group are mainly those enrolling later than they intended to. Only a small minority of them never enter higher education at all.

The plots at the bottom of figure 2 show the impact of parental education on the enrollment rates by educational origin for each intention. There is a consistent pattern of a higher enrollment of respondents with a higher educational background throughout all intention-groups. The strongest dependence on parental education exists among those students who are undecided (shown by the differences between the bars and a standardized logit coefficient of 0.40^{**}). This can again be explained by the fact that the undecided young adults are the most heterogeneous group in their affinity to higher education. An alternative explanation could be that indifferent people are particularly likely to follow the example of their parents due to a lack of alternative (more rational) motivation. Regrettably, these two arguments cannot be separated from each other here.

For testing the cooling out hypothesis, the more interesting categories consist of those students with ambitions to enter higher education. The vast majority of those who want to enter as soon as possible do realize this. There are small differences by

parental education. Even among those male respondents who have to complete a one-year compulsory service (military or social service) before enrolling, virtually all respondents eventually enroll (97 per cent, independent of service duties). That the share is the same among those (male) respondents having to complete compulsory service is interesting. This suggests that 'cooling out', i.e. giving up the intention to achieve tertiary education, is not merely a question of time. Young adults with the intention to enroll eventually enroll, even if forced to wait for some time. This is not the case for participants in apprenticeship training. Although these programs take longer, the stronger 'cooling out' in this group is probably due to the considerably better labor market opportunities with a vocational degree. This is clearly contradicts Oettinger's hypothesis, expecting that young adults discover their potential and rather increase their educational aspirations.

In the next step I address the question of the explanations of these regularities. To the initial regression models from figure 2 (which is reported again as model 1 in table 2) variables representing the theoretical mechanisms discussed before are added in the subsequent models.

Table 4.1.2: y-standardized discrete time logistic (log y*, first row) and linear probability (lpm, second row) regression models of social origin on entering higher education (HE).

(ref. cat.: none of parents holding academic degree)	**model 1: total effect**		**model 2: M1 + primary effects**		**model 3: M2 + indicators for other mechanisms**	
educational intention	both parents HE degree	one parent HE degree	both parents HE degree	one parent HE degree	both parents HE degree	one parent HE degree
study immediately, started studying as soon as possible dep.variable: entered HE as soon as possible N=3362	log y*: 0.11+ lpm: 0.03+	0.03 -0.00	0.00 -0.01	-0.00 -0.02	0.00 -0.01	-0.00 -0.01
study after vocational education dep. variable: entered HE N=790	0.24** 0.18**	0.11x 0.07+	0.17* 0.13*	0.08 0.04	0.16+ 0.12+	0.06 0.03
study after another activity, enrolled in higher education dep. variable: entered HE N=374	0.17+ 0.10*	0.09 0.05	0.02 0.04	0.06 0.04	-0.00 0.04	0.05 0.03
undecided, enrolled in higher education dep. variable: entered HE N=627	0.41** 0.27**	0.17** 0.10+	0.27** 0.18**	0.17** 0.09+	0.24** 0.15+	0.15* 0.06
no plans to study in tertiary track, non-persistence: enrolled in higher education dep. variable: entered HE N=740	0.23+ 0.12+	0.10 0.05	0.16 0.08	0.02 0.01	0.10 0.06	0.01 0.01

Data source: HIS Panel Study of students entitled to higher education, unweighted. Own calculations. N=5893.
two-sided z- or t- test: significance x p<.10, + p < .05, * p < .01, ** p < .001

Table 2 shows the results of discrete time logistic regression models separately by sub-samples reporting a certain intention. As logistic regression coefficients from nested models are incomparable due to unobserved heterogeneity influencing the dependent variable, I report y-standardized logit coefficients (Mood, 2010) and linear probability models. Model 1 is the 'total-effects' model with parental education as the only independent variable. The 'net secondary effects' model also contains my

indicators for primary effects (grade of upper secondary degree centralized by federal state, type of school where upper secondary degree was obtained, type of upper secondary degree, age at time of the survey). In figure 1 that shows the total effects of parental education, there were inequalities in the entry rate to university for all groups. This result is repeated in model 1. In model 2, I introduce explanatory variables operationalizing effects of educational origin due to previous performance in the school system. Comparing this with the results of model 1 these indicators explain inequalities for those students who reported that they had planned to either study immediately or not to study at all, as well as for those students who planned to study after another activity. However, for the larger inequalities among those young adults planning higher education after vocational training or who are undecided, inequalities can only be partly explained. Altogether, performance-based effects of parental education can explain inequalities in later changes of plans to a large extent. Hence, it can be argued that students implement most of the secondary, decision-based origin effects in their earlier intentions with regard to their post-secondary education, while changes in their educational intentions depend to a large degree on their previous performance. This finding can have several reasons. Students with a lower educational background could have less realistic aspirations for their further educational career, taking into account their scholastic performance. Alternatively, the numerus clausus for several fields of study could divert more students with a lower educational background away from higher education due to poor grades, although they had hoped to be accepted.

In most cases, young adults with a lower educational family background will follow their intentions with the same steadfastness as their peers form higher backgrounds. This, however, depends on the intention itself and is not true for all students. Among the models in column 2, there are clear and significant effects of educational background left after checking educational performance, if the students intended to study after vocational education or did not have any expectations about their future educational careers. Among those students who do not want to enter higher education, there still is a remaining effect which is, however, not statistically significant (but not trivial in size, it shows a ceteris paribus 8 percentage points higher entry rate into higher education for students where both parents have a degree in higher education).

The third series of models corresponds to all other explanations discussed above. All indicators are introduced at once, since this is enough to see the essence of the results: all of these indicators for explanation of the secondary effects do not change the results. Effect sizes in the linear probability model are reduced only marginally, none of the substantive findings about parental influence changes. It turns out that these factors do not explain secondary effects of parental education on the changes in educational intentions.

4.1.4 Discussion and Conclusions

This chapter aimed at localizing the impact of specific sources of educational inequality over a period in the biography of students that is crucial for their entry into post-secondary education. I started out by looking at the intentions of young adults with respect to their future educational career and found that children coming from diverse family backgrounds differ markedly. These intentions are then found to be highly persistent with the actual educational career. This implies that early decisions are the major source of unequal educational attainment. Students are not 'short-sighted' and plan their educational career ahead of time –and at least for the German context rather 'delays' than 're-entries', i.e. later corrections of earlier decisions are less important. If, however, the educational career deviates from what was intended when the students left secondary education, the young adults tend to change towards stronger conformity with the parental model, i.e. those young adults with better educated parents more often enroll in higher education. Therefore, 'cooling out' of lower-class students exists to some degree, but its contribution to the total inequality in the entry to higher education is small. The impact of changes in intentions could though be stronger if I considered drop-outs in the analysis, who certainly are another important group of students not persistent in their plans. Revisions of educational intentions leading away from university were most likely when the respondents planned to enter higher education after vocational education. Those who planned to study after another activity in on the other hand in most cases indeed do so. Hence, the vocational training system in Germany 'cools out' the educational ambition of working-class students to some degree. The reason could be that vocational training offers a smooth transition to stable labor market positions. Similar to the findings

from US community colleges (Brint and Karabel, 1989), even students who intended to achieve more education often stayed in the labor market.

These findings show that major sources of parental education effects on educational career patterns in Germany are to a large extent the results of the long-term intentions and plans of young adults. The high consistency of educational careers with previous plans implies that the sources for educational origin differences have to be looked for in the different plans of young adults at the time when leaving secondary school.

From what is known about country differences, this could be a German peculiarity. As section 2 has shown, in the US and Sweden students move between work and education much more frequently. The rather inflexible German system of higher education and labor market could force students to think more carefully about their educational future. Therefore, the conclusion of 'all pre-planned' educational careers cannot easily be generalized to these contexts. Even though the strong explanatory power of earlier characteristics for the social origin differences reported in section 3 did point into the same direction.

Previous studies as in section 3 often showed for many contexts that social origin affects delayed entries, but neither asked for the mechanisms nor the time-points of educational decisions in the life course. The results presented in this chapter go beyond this point and start to test several hypotheses about possible mechanisms to explain social inequalities for changes in educational intentions. As just as inequality in re-entry in Sweden and the US, class differences the conformity of educational intentions with the actual educational career is to a large extent attributable to the lower scholastic performance of working-class students. On the contrary, the indicators used to operationalize secondary effects of educational background did not explain parental background effects. In this respect, undecided young adults are the exception. There seem to be strong barriers for less well-performing students in Germany, who come more often from families with a lower educational background. It is unclear if this is due to a reduction of success of lower-class children in the educational system and thereafter in the labor market, or a result of the numerus clausus system. At least part of the students probably cannot meet the requirements to be accepted in their favorite study program and therefore choose alternatives to higher education to spend waiting time until they get admitted. With regard to financial resources, the perceived probability of success, and the status maintenance motive

explaining different educational decisions, the indicators used do not contribute much to the explanation of educational inequality. It should be noted that the costs of higher education vary strongly between country-contexts and that this mechanism could play a more important role where tuition fees are higher than in Germany, such as in the US.

The fact that the biggest changes occur with regard to those intentions that imply a rather late enrollment in higher education could be caused by other biographical events becoming more important with increasing age, e.g. marriage or childbirth. Possibly, such events occur more frequently among young adults with a lower educational background, and the change in their life situation hinders them from entering higher education. This should motivate further research into the question of how the situation of young adults in different stages of life conditions their educational attendance. An alternative interpretation would be that lower-class children are less convinced with their intentions from the beginning and pursue them with less steadfastness. This explanation is supported by the fact that students with a lower educational background are more often in the category of those who are undecided about their future attendance in higher education. Again, this calls for further research.

The findings also help to evaluate the practice of taking intentions, expectations or plans as a proxy for actual attendance of certain educational tracks (e.g. Becker and Hecken, 2009a). This practice will introduce some bias into the results of these studies, but is very unlikely to alter the substantial conclusions. Furthermore, it leads to conservative estimates in the sense that they will rather underestimate than overestimate the impact of educational origin.

4.1.5 Appendix

Table 4.1.3: Logistic and linear probability regression models; social origin on persistence of the intention to *study immediately*.

	model 1: total effect		**model 2: M1 + primary effects**		**model 3: M2 + indicators for other mechanisms**	
	coefs.	z-value	coefs.	z-value	coefs.	z-value
both parents HE degree	log y*: 0.11**					
	lpm: 0.03**	2.57	0.00 -0.01	0.15	0.00 -0.01	0.04
one parent HE degree	0.03 -0.00	0.69	-0.00 -0.02	0.06	-0.00 -0.01	-0.03
second. school final exam: GPA			0.03*** 0.01***	10.71	0.03*** 0.01***	10.18
sex (male=1)			0.25*** 0.07***	2.76	0.25*** 0.07***	2.81
type of sec. degree (Abitur=1)			0.38*** 0.13***	4.54	0.39*** 0.13***	4.66
type of sec. school (Gymnasium=1)			0.11** 0.03*	2.14	0.12** 0.04**	2.46
draftee: compulsory military service (males)			-0.39*** 0.00	-4.24	-0.39*** 0.01	-4.34
age			0.01 0.00	0.71	0.02 0.01	1.15
status maintenance					-0.03** -0.01	-2.00
financial resources						
financial independence					0.05*** 0.02***	4.37
short duration of training					0.01 -0.00	0.69
perceived probability of success						
expectation of good career opportunity					-0.05** -0.03***	-3.08
positive congruence with own capability					0.09*** 0.03***	4.47
constant	0.856***		0.576***		0.507***	

Data source: HIS Panel Study of students entitled to higher education, not weighted.
Own calculations. N=5893.
two-sided z- or t- test: significance *p < 0.10, ** p < 0.05, *** p < 0.01

Table 4.1.4: Logistic and linear probability regression models; social origin on persistence of intentions to *study after vocational education.*

	model 1: total effect		**model 2: M1 + primary effects**		**model 3: M2 + indicators for other mechanisms**	
	coefs.	z-value	coefs.	z-value	coefs.	z-value
both parents academic degree	log y*: 0.24***	3.71				
	lpm: 0.18***		0.17*** 0.13***	2.74	0.16** 0.12**	2.45
one parent academic degree	0.11* 0.07*	1.80	0.08 0.04	1.45	0.06 0.03	1.02
second. school final exam: GPA			0.03*** 0.02***	5.39	0.02*** 0.02***	5.22
sex (male=1)			0.21** 0.11*	2.37	0.22** 0.12*	2.33
type of sec. degree (Abitur=1)			0.30*** 0.19***	3.11	0.28*** 0.19***	2.89
type of sec. school (Gymnasium=1)			0.14** 0.08*	2.04	0.14** 0.08	2.03
draftee: compulsory military service (males)			0.29*** -0.15**	2.84	0.29*** -0.16**	2.82
age			0.04 0.01	1.43	0.03 0.01	0.94
status maintenance					-0.05** -0.03**	-2.09
financial resources						
financial independence					0.07*** 0.05***	3.92
short duration of training					-0.06*** -0.03***	-3.92
perceived probability of success						
expectation of good career opportunity					-0.00 0.01	-0.00
positive congruence with own capability					0.04 0.02	1.62
constant	0.439***		-0.029		0.248	

Data source: HIS Panel Study of students entitled to higher education, not weighted.
Own calculations. N=5893.
two-sided z- or t- test: significance *p < 0.10, ** p < 0.05, *** p < 0.01

Table 4.1.5: Logistic and linear probability regression models; social origin on persistence of the intentions to *return to higher education after other activities.*

	model 1: total effect		**model 2: M1 + primary effects**		**model 3: M2 + indicators for other mechanisms**	
	coefs.	z-value	coefs.	z-value	coefs.	z-value
both parents academic degree	log y*: 0.17**	2.05				
	lpm: 0.10***		0.02 0.04	0.24	-0.00 0.04	-0.00
one parent academic degree	0.09 0.05	0.96	0.06 0.04	0.80	0.05 0.03	0.56
second. school final exam: GPA			0.03*** 0.01***	5.00	0.03*** 0.01***	4.69
sex (male=1)			0.30 -0.05	1.38	0.30 -0.02	1.31
type of sec. degree (Abitur=1)			0.30 0.14*	1.49	0.33 0.15**	1.62
type of sec. school (Gymnasium=1)			-0.14 -0.08	-1.00	-0.14 -0.09*	-1.00
draftee: compulsory military service (males)			-0.35 -0.10	-1.21	-0.35 -0.12	-1.19
age			-0.01 -0.05**	-0.26	-0.03 -0.05***	-0.60
status maintenance					-0.03 -0.00	-0.89
financial resources						
financial independence					0.08*** 0.03**	3.06
short duration of training					0.01 0.01	0.39
perceived probability of success						
expectation of good career opportunity					-0.03 0.00	-0.85
positive congruence with own capability					0.04 -0.00	1.16
constant	0.861***		1.697***		1.824***	

Data source: HIS Panel Study of students entitled to higher education, not weighted.
Own calculations. N=5893.
two-sided z- or t- test: significance *p < 0.10, ** p < 0.05, *** p < 0.01

Table 4.1.6: Logistic and linear probability regression models; studying after being undecided initially.

	model 1: total effect		**model 2: M1 + primary effects**		**model 3: M2 + indicators for other mechanisms**	
	coefs.	z-value	coefs.	z-value	coefs.	z-value
both parents academic degree	log y*: 0.41***	5.70				
	lpm: 0.27***		0.27*** 0.18***	3.93	0.24*** 0.15***	3.45
one parent academic degree	0.17*** 0.10**	2.64	0.17*** 0.09**	2.73	0.15** 0.06	2.46
second. school final exam: GPA			0.02*** 0.01***	3.75	0.02*** 0.01***	3.48
sex (male=1)			0.14 0.05	1.59	0.18** 0.06	2.10
type of sec. degree (Abitur=1)			0.64*** 0.43***	5.42	0.63*** 0.41***	5.58
type of sec. school (Gymnasium=1)			0.01 -0.02	0.10	-0.03 -0.03	-0.43
drawn for compulsory service (males)			0.06 0.01	0.06	0.05 0.03	0.56
age			0.01 -0.00	0.30	-0.01 -0.01	-0.15
status maintenance					-0.07*** -0.03**	-3.03
financial resources						
financial independence					0.13*** 0.08***	6.17
short duration of training					0.01 -0.00	0.69
perceived probability of success						
expectation of good career opportunity					0.02 0.02	0.56
positive congruence with own capability					0.03 0.01	1.36
constant	0.606***		0.258		0.523	

Data source: HIS Panel Study of students entitled to higher education, not weighted.
Own calculations. N=5893.
two-sided z- or t- test: significance *p < 0.10, ** p < 0.05, *** p < 0.01

Table 4.1.7: Logistic and linear probability regression models; social origin on persistence of the intention *not to enter higher education (HE).*

	model 1: total effect		**model 2: M1 + primary effects**		**model 3: M2 + indicators for other mechanisms**	
	coefs.	z-value	coefs.	z-value	coefs.	z-value
both parents academic degree	log y*: 0.23**	2.19				
	lpm: 0.12**		0.16 0.08*	1.64	0.10 0.06	1.00
one parent academic degree	0.10 0.05	1.28	0.02 0.01	0.26	0.01 0.01	0.15
second. school final exam: GPA			0.03*** 0.01***	4.26	0.03*** 0.01***	4.25
sex (male=1)			0.37*** 0.17***	3.02	0.30** 0.14**	2.43
type of sec. degree (Abitur=1)			0.65*** 0.21***	4.09	0.62*** 0.20***	3.95
type of sec. school (Gymnasium=1)			0.17* 0.09*	1.89	0.18* 0.09*	1.94
drawn for compulsory service (males)			0.15 -0.01	1.10	0.17 -0.00	1.18
age			0.08* 0.04*	1.83	0.08* 0.04*	1.77
status maintenance					-0.06** -0.02*	-1.99
financial resources						
financial independence					0.06** 0.03**	2.35
short duration of training					-0.01 -0.01	-0.26
perceived probability of success						
expectation of good career opportunity					-0.05 -0.03	-1.40
positive congruence with own capability					0.08** 0.04**	2.42
constant	0.254***		-0.678*		-0.594	

Data source: HIS Panel Study of students entitled to higher education, not weighted.
Own calculations. N=5893.
two-sided z- or t- test: significance *p < 0.10, ** p < 0.05, *** p < 0.01

Table 4.1.8: Linear probability regression models of social origin on persistence of study plans for those who are enlisted in compulsory military or civil community service (HE = higher education).

(ref. cat.: none of parents holding academic degree)	**model 1: total effect**		**model 2: M1 + primary effects**		**model 3: M2 + indicators for other mechanisms**	
educational intention	both parents Higher educ. degree	one parent HE degree	both parents HE degree	one parent HE degree	both parents HE degree	one parent HE degree
study immediately, started studying as soon as possible dep. variable: entered HE as soon as possible N=1175	0.03	0.04x	0.00	0.03	0.00	0.03
study after vocational education dep. variable: entered HE N=166	0.15	0.05	0.08	0.01	0.03	-0.04
undecided, enrolled in HE Dep. variable: entered HE N=150	0.28*	0.17+	0.25+	0.19+	0.22+	0.18+
no plans to study in tertiary track, non-persistence: enrolled in HE Dep. variable: entered HE N=104	-0.20	-0.03	-0.24	-0.05	-0.25	0.01

Data source: HIS Panel Study of students entitled to higher education, not weighted.
Own calculations. N=5893.
one-sided z-test: significance x p< 0.10, + p < 0.05, * p < 0.01, ** p < 0.001

4.2 Class Origin and Young Adults' Re-Enrollment Decisions in the US – is Parental Status the Minimum Acceptable Status?

This chapter examines re-enrollment events among young adults who have previously participated in the labor market in the US. The influence of social origin on re-enrollment is examined to test hypotheses based on the motive that families assign high priority to the reproduction of their status over generations. To make this possible, the effects of the childrens' class position relative to the families' class position are estimated. The children from lower classes re-enroll less often than those from the upper classes, but once the parental class has been reached, re-enrollment is less likely to occur. This supports the frequently assumed theoretical mechanism that families attempt to avoid downward mobility and to reproduce their status in the labor market. But it only partly explains class differences in re-enrollment. Class-related differences in test-scores and scholastic performance are even more important.

This chapter is a revised version of the following article:

Jacob, M. and F. Weiss (2011). 'Class Origin and Young Adults Decision to Reenroll.' *Research in Social Stratification and Mobility* 29(4): 415-426.

4.2.1 Introduction

Against the background of inequalities even in late re-enrollment, this chapter focuses on one key aspect of nontraditional postsecondary enrollment patterns in young adults, *the transition from the labor market (back) into higher education and the impact of social background on re-enrollment*. The return from the labor market to the education system can justly be regarded as a further educational threshold – assuming other than in the previous that at least a part of the students decides to re-enroll as the result of revised decisions. Children from higher social backgrounds may be more likely to re-enter education because their parents encourage them to do so. This hypothesis is related to the theory of aversion to downward intergenerational class mobility (Breen and Goldthorpe, 1997), presented at the outset of this chapter as one of the mechanisms for explaining lower enrollment rates into postsecondary education even for late transitions. The case of late educational enrollment is a favorable constellation for testing hypotheses derived from this theory, since status reproduction

failure can be operationalized directly by comparing parental class to the class position the child has already reached.

This hypothesis is tested empirically by analyzing the US National Longitudinal Study of Youth 79 (NLSY79). This dataset enables to operationalize the relative status achievement of parents and children directly and time varying. As a result, there is evidence for the 'relative risk aversion' mechanism, but beyond that, the influence of performance-based predictors is *in toto* much stronger.

4.2.2 Social Inequality in Educational Decisions: Re-enrollment and intergenerational social mobility

In line with the few other studies dealing with inequality in later re-enrollment, social origin differences in the re-enrollment decision became evident in section 3.2. Using NLSY79 data, Oettinger (1993) and Light (1996) find that both low parental education and low family income have a negative impact on the decision to enroll in adulthood. Effects of mother's education have been shown by Marcus (1986), who analyzes the NLS Young Men Data, and also by Astone et al. (2000), who find higher re-entry rates for inner-city African Americans whose mothers have attended at least 'some college'. Elman and O'Rand (2007) consider the father's occupational prestige and find a significant and also positive influence on the probability of re-entering education. While previous research has confirmed links between re-enrollment and parental education, income, and occupation, none of these studies explicitly refer to relative risk aversion as the main theoretical explanation, nor do any of them model relative class position directly by comparing the child's current class position to the parents' class status up to the point at which re-enrollment occurs. In the following I discuss this theoretical mechanism in greater detail and derive hypotheses from this framework that can be tested empirically.

In the Breen-Goldthorpe-model, the central assumption of purely rational decision-making is relaxed. One mechanism in this model is that families strive to achieve at least the same status for their offspring as they have achieved themselves ('*relative risk aversion'* or *'status reproduction'*). As families interpret non-achievement of this status as 'failure', upper-class families have greater incentives to invest in education in order to avoid downward mobility. The other mechanisms discussed under chapter 4.0 are regarded in this model as well. With regard to the relative status mechanisms, the re-entry situation has the appeal that failure in the

achievement of the parental class status can be operationalized directly. According to this theory, the ultimate goal of educational decisions is the achievement of a certain class positions. Educational achievement is an intermediate good in this process of achievement. Since education is an efficient vehicle for the achievement of class status, one obvious option in the case of status reproduction failure is further investment in education. In early educational decisions, education can only be seen as a resource for avoiding downward mobility. In the case of late educational decisions, however, failure to achieve parental class status can be experienced directly. Therefore young adults can be expected to react to non-achievement of parental class status with an ad hoc decision to re-enroll.

If achieving at least the parental status is an empirically important motive, not only parental class would be expected to have an effect on re-enrollment, but also the *relative* achievement of the child in the labor market compared to that of the parents. If parental class status has been achieved – regardless of college graduation – then re-enrollment should not occur, even if the parents' or the student's own resources would make it a viable proposition. There should be higher re-enrollment rates for children who fail to achieve at least the same class status as their parents, since additional education could be seen as a way of achieving the parents' class. According to this view, it is not the absolute status of the parents that matters (for provision of resources, confidence about abilities, etc.) but the *child's relative class* status compared to that of the parents. This leads to the hypothesis that the achievement of parental (or higher) class status via participation in the labor market reduces the likelihood of re-enrollment.

4.2.3 Data and Methods

As in the previous chapters on the US, I draw upon the National Longitudinal Study of Youth 1979 (NLSY79, U.S. Department of Labor, 2008). Again, only the birth-cohort respondents from the main sample as of 1961 are selected, restricting the perspective to those attaining either a high school degree or GED. This leaves 2140 cases for the empirical analyses. In practice, I look at students already working full-time in the labor force[27], and analyze whether they re-enter education or not, and if so, how long it takes before they re-enroll. As this depends on both re-enrollment itself

[27] 'being in the labor force' is defined as working at least 25 hours per week or being unemployed.

and its timing, techniques of event-history analyses are appropriate. I specify an accelerated failure time (AFT) model.[28] Applying a parametric model of this kind requires the specification of a functional form for the hazard rate assumed. I have opted for the log-logistic distribution, as it specifies hazard rates very flexibly and can model a less steep curve than, say, the Weibull-distribution would assume. In the AFT model, the dependent variable is the logarithm of survival time, rather than the hazard rate figuring in the frequently used Cox regression. Accordingly, the estimated coefficients have to be interpreted in terms of the failure functions, i.e. if β is greater than zero, then *x(t)* has a positive effect on failure time, and the event (here: re-enrollment) is expected to occur later. If β is smaller than zero, the event will occur sooner. Time varying covariates can be included. For each person I use one observation for each month, which enables us to include covariates that change from one month to the next.

Social origin as the central independent variable is again measured by a simplified version of the EGP class scheme (Erikson, Goldthorpe and Portocarero, 1979) as described in chapter 3.0.1. The classification is in principle the same as in section 3 of this volume, but classes are differently grouped. Parental class is measured retrospectively in terms of the occupation of the adults in the household where the child was living at the age of 14. In cases where only one adult is present, his/her class position is defined as the dominant class. Class construction is based on the 1970 census classification of occupations, using the coding scheme developed by Hout (2005). From 2002 onwards, the 2000 US census classification of occupations is the only one available. On this basis I have constructed a classification of my own that follows the Hout coding scheme as closely as possible. EGP classes are then collapsed into four categories, as set out in Table 1. After simplifying the class scheme, the remaining categories can be treated as an ordinal variable. In previous chapters the scheme has been simplified further by collapsing the working classes into one category. For the questions tackled in this chapter, it is important to exploit as much

[28] The AFT model assumes a linear relationship between the log of survival time t and the independent variables x: $\ln(t) = x(t)\beta + z_i$ where β is a vector of parameters and z is an error term. An AFT regression coefficient relates proportional changes in survival time to a unit change in a given regressor, with all other characteristics held constant. The advantage over proportional hazard models is – as discussed in length in section 3 – that it does not require the proportional hazard assumption, and the interpretation of the coefficients is easier than for proportional hazard regressions (Cleves et al. 2002). Using a proportional hazard regression model, a test for Schoenfeld-residuals indicated that the proportional hazard assumption cannot be justified for the central independent variable 'parental class'.

as possible of the ordinal dimension of the class-scheme and to keep the bottom category as small as possible since this category cannot contribute to an analysis of downward mobility. The children's current class is then set into relation to the highest class of both parents to define the relative class position. The respondent's current class is constructed in the same way as the parents'.

Table 4.2.1: EGP class scheme and simplified version.

full EGP class scheme categories		simplified version
I	professionals and managers, higher grade	Service Class (1)
II	professionals and managers, lower grade; technicians, higher grade	Service Class (1)
IIIa	routine non-manual employees, higher grade	Intermediate (2)
IIIb	routine non-manual employees, lower grade	Working Class (3)
IVabc	small employers and self-employed workers	coded to other classes according to occupation
V	technicians, lower-grade supervisors of manual workers	Intermediate (2)
VI	skilled manual workers	Working Class (3)
VIIa/b	unskilled manual workers	Routine Working Class (4)

The resulting variable for relative class position takes the value of one if the parental class has already been reproduced by the respondent's current class position. Otherwise the value is zero. Unemployment of the young adults is counted as 'non-achievement of parental class'. Accordingly, the respondent's relative position to the father's is a time-varying variable that can change over process time. It can take a different value every month and is included in the analysis with a time lag of 6 months.

To cancel out performance-based primary effects accounting for social class differences in re-enrollment patterns, I use the percentiles of the 'Armed Forces Qualification Test' (afqt), an aptitude test conducted with all NLSY79 respondents.[29] As controls, several variables are included that either have strong links with selection for the sample or may lead to misinterpretations of the class-origin effects. These are gender, race, birth cohort, age when the school-leaving certificate was obtained, type

[29] The 'Armed Services Vocational Aptitude Battery' was administered to the whole NLSY sample in 1980. The score is a weighted average of different scores achieved in tests on such things as arithmetical reasoning, numerical operations, vocabulary, and paragraph comprehension. For the use of the score in a similar context see Oettinger (1993).

of previous degree (high school diploma vs. GED), and achievement of an A.A. degree by the respondent. To cater for the hypothesis that the main mechanism operative in class-biased selection for re-enrollment is the lack of financial resources in lower-class families, I control for the poverty status of the household the student is living in at the age of eighteen. Poverty level is included in the NLSY dataset by using the 'Poverty Income Guidelines' issued annually by the US Department of Health and Human Services. Table 4.2.4 in the Appendix provides a descriptive overview of all variables.

4.2.4 Results

The empirical analysis takes place in two stages. First I shortly reproduce the effects of class inequality in the in re-enrollment rates from section 3 with the current sample, model specification and parental class definition. This analysis disregards the child's own achievement. Second, I look at 'relative' class status, taking into account whether the class of origin has already been achieved or not. The modeling strategy differs in each case. In the first stage I include all the respondents in the sample, whereas in the second stage I estimate separate models for different classes of origin.

The bivariate model 1 in table 4.2.2 considers only the (highest) parental class and shows the 'gross' effect of social origin on re-enrollment. It turns out that all other classes enroll in higher education significantly more slowly and less often than the service classes *(reference category)*. This effect is particularly marked among the unskilled working classes, which could not be seen in the comparative models in section 3. As a second step, a more elaborate model includes the poverty status of the household when the child was eighteen years old and academic performance to rule out the two alternative explanations of 'primary effects' and monetary constraints. Primary effects are operationalized as *aptitude*, measured using the afqt-percentiles, whether the respondent holds a *GED* or a *high school diploma* and whether he/she holds an A.A. degree at the time of re-enrollment as a time-varying variable (Model 2 in Table 2). Further, I control for race to account for racial discrimination or policies compensating racial disadvantages at college entry (cf. Grodsky, 2007).

Table 4.2.2: Log-logistic regression models on the time till re-enrollment in college education.

explanatory variables	**model 1**	**model 2**
max. class of parents		
intermediate	0.42*	0.35
(ref.: salaried)	(2.08)	(1.76)
skilled working class	0.45*	0.23
	(2.30)	(1.19)
unskilled working class	0.91***	0.53*
	(4.10)	(2.35)
poor		0.27
		(1.32)
GED		-0.16
(ref.: high school diploma)		(-0.71)
A.A. degree obtained		-2.21***
(time-varying)		(-8.20)
afqt score		-0.02***
		(-6.87)
male		0.60***
		(4.06)
race: black		-1.02***
(ref.: white)		(-3.91)
race: hispanic		-1.18***
		(-4.17)
cohort 1961 *(ref.: 1964*)		-0.18
		(-0.82)
cohort 1962		-0.29
		(-1.37)
cohort 1963		-0.14
		(-0.64)
constant	6.29***	7.79***
	(44.44)	(24.25)
ln gamma	0.46***	0.41***
	(12.92)	(11.62)
N (persons)	2131	2131
number of failures	635	635

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Data source: NLSY79

In Model 2 in table 4.2.2 (the full model), the coefficients of skilled-working-class and intermediate-class parents are reduced and become insignificant. In particular, the afqt-score and the A.A. degree have strongly positive effects on re-enrollment, indicating the importance of aptitude and previous achievement for admission procedures into higher education in the US. Class differences remain, but they need to be interpreted with caution due to their weak statistical significance (see section 3). The following section focuses on the role of the 'relative risk aversion' or 'status reproduction' argument in the decision to re-enroll as a possible explanatory mechanism for the residual secondary effects of parental social class.

With the 'relative class'-hypothesis I argued that it is important for later enrollment whether parental class has already been attained or not. In Models 6 to 8 I add a time-varying 0–1–variable for attainment of parental class. These models need to be estimated separately for the three classes that can make downward moves. The routine working class is not considered, because here class reproduction failure is ruled out. All other control variables are the same as in Model 2 of table 4.2.2.

Table 4.2.3: Log-logistic regression models on the time till re-enrollment in college education by parental class – the effect of 'achieving parental class status'.

explanatory variables	**service**	**intermediate**	**skilled working**
achieved parental class status	0.393	0.607*	-0.252
(time varying)	(1.19)	(1.99)	(-0.93)
poor	0.110	0.805	-0.144
	(0.27)	(1.69)	(-0.41)
GED	0.0994	-0.829	-0.316
(Ref.: high school diploma)	(0.20)	(-1.78)	(-0.82)
A.A. degree obtained	-1.776**	-2.436***	-1.873***
(time varying)	(-3.23)	(-4.90)	(-4.08)
afqt score	-0.0202**	-0.0247***	-0.0300***
	(-3.14)	(-3.70)	(-4.95)
male	0.137	0.794**	0.967***
race: black	-1.861**	-0.729	-0.939*
(Ref.: race white)	(-3.00)	(-1.24)	(-2.27)
race: Hispanic	-0.493	-1.432*	-0.939
	(-0.79)	(-2.50)	(-1.74)
cohort 1961 *(Ref.: 1964)*	-0.505	-0.0760	-0.0827
	(-1.29)	(-0.18)	(-0.21)
cohort 1962	-0.401	0.0913	-0.0414
	(-1.04)	(0.22)	(-0.11)
cohort 1963	0.364	-0.519	0.333
	(0.90)	(-1.30)	(0.81)
constant	7.800***	7.877***	8.082***
	(13.58)	(13.43)	(14.92)
ln gamma	0.467***	0.349***	0.334***
	(7.53)	(4.70)	(4.82)
N	609	493	576
no. of failures	213	148	168

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Data source: NLSY79

In the samples of service-class and intermediate-class children I find positive coefficients for those who have reached at least the class status of their parents. This indicates a deceleration in the re-entry process, which is in accordance with the suggestion in hypothesis 2 that relative class position has an impact above and beyond other class effects. This means that children from the service and intermediate classes

withdraw from their efforts to re-enroll in higher education if they have already attained at least the class status of their parents. However, the coefficient for the service classes is not significant, and for intermediate-class offspring it is only weakly significant at the 0.05 level (two-sided test). This may partly be due to the smaller sub-samples in comparison the analyses of inequality in re-enrollment in table 4.2.2. The coefficient for the skilled working classes is negative, implying that children from those classes who have managed to get a job at that level are more likely to re-enroll. This is not surprising, as I am only considering post-secondary education, which will probably not be necessary for attaining skilled as opposed to unskilled working status. In sum, for the secondary effects of educational inequality I find supporting evidence for the hypothesis that class-achievement goals are geared to relative parental class and that intergenerational downward mobility is avoided by giving up a position in the labor market and re-enrolling for college.

4.2.5 Conclusion

In accordance with section 3 I find that effects of parental class are present even in very late educational decisions, i.e. for re-enrollment back from the labor market to higher education. There are ‘secondary effects’ still present after controlling for primary effects and can be explained by the ‘status reproduction’ or ‘relative risk aversion’ motive. This is a central mechanism in the model for explaining secondary effects proposed by Breen and Goldthorpe (1997). Testing it at the time when young adults enter the labor market has the advantage that it can be operationalized by directly comparing young people’s class status with that of their parents. This chapter has shown supporting evidence for this argument, as young adults re-enroll to a lesser extent once they have achieved the same class as their parents.

4.2.6 Appendix

Table 4.2.4: Descriptive overview on the distribution of all explanatory variables.

explanatory variables	**Mean (SD) / %**
max. class of parents	
salaried	28.6
intermediate	23.1
skilled working class	27.0
unskilled working class	21.3
poor	16.8
GED *(Ref.: high school diploma)*	13.3
A.A. degree obtained *(time-varying, here: ever obtained)*	4.2
afqt score	52.5 (26.7)
male	51.3
race	
black	10.0
hispanic	6.5
white or other	83.5
cohort 1961	25.5
cohort 1962	27.6
cohort 1963	25.5
cohort 1964	21.4
N (persons)	2131

Data source: NLSY79

4.3 Status Demolition and Re-Enrollment in Context: Comparing Sweden and the US with Respect to Re-Enrollment Decisions upon Intergenerational Downward Mobility

This chapter now goes one step beyond the micro-level and involves a country comparison again. It follows the strategy of chapter 4.2 by asking whether factually status demolished young adults will be more likely to re-enroll than those who have achieved their parents' class position. From a comparative perspective this mechanism is now hypothesized to be more important in Sweden than in the US. This hypothesis can be confirmed, even though the overall impact of status demolition on re-enrollment is still not very strong.

A previous version of this chapter has been presented at the final conference of the EQUALSOC-network in 2010 in Amsterdam. I would like to thank the commentators at this workshop for their constructive comments.

This chapter deviates from the individual focus of this section in going one step further and taking a comparative view on the results of chapter 4.2. Comparing re-enrollment between different financial support-systems for non-traditional students allows studying the sensitivity of re-enrolling students from different social origins. Challenging my findings from section 3, the strong system similarity between the US and Sweden is put into question. While inequality in educational careers is on the macro-level distributed fairly similar in these two countries, the contexts differ by micro-level conditions they impose on the decision makers. While the systems institutionalize educational careers in a similar way and are rather open for second-chance education, the costs of postsecondary education are markedly lower in Sweden. Thus, the two countries qualify for a comparison of individual decisions with respect to this mechanism. In the following I will therefore employ a similar analysis as in chapter 4.2 in order to compare whether the specific institutional environments, linked to direct costs of education, trigger re-enrollment. Furthermore, following on with testing the relative risk aversion argument from chapter 4.2, I argue that the effects of the relative status should be even stronger in Sweden than in the US due to

the high direct costs of postsecondary education in the North American context that could to some degree undermine the chances of working-class students even when achieving their parents' status. Higher class students on the other hand have higher earnings than the former when achieving parental status and thus due to the direct costs would enroll more often than lower class students. To avoid that this effect cancels out the relative status mechanism, the Swedish context with its low direct costs of education and compressed wages is a good, but less conservative, comparison case to the US.

4.3.1 Why Should Individual Decisions to Re-Enroll Differ between Swedish and American Young Adults?

The results of chapters 2.5 and 3.2 show Sweden and the US being in the same camp with regard to the role of social origin for belated education: educational careers are flexible, and inequality in later entries is still high compared to e.g. Germany. The opportunity structures, with regard to the educational system, are similar so one could assume that these are the only conditions accounting for inequality in late enrollment. But are the other remarkable differences between the contexts, which were highlighted by previous research, indeed irrelevant? Given the manifold differences shaping the decision on the micro-level, more investigation is needed before arriving at this conclusion. The main mechanism to expect differences between the two systems is the different cost for postsecondary education in the two countries. The openness of the higher education system is not only defined by whether there are nominal opportunities, but also the costs for studies which differ remarkably between the two systems. The costs in Sweden are significantly lower, as comparatively generous financial support is granted and no tuition fees apply. While the qualification requirements are equally low in the US, costs for higher education are high.

The mechanism of re-enrollment as a strategy to 'escape' intergenerational status demolition does not directly imply a hypothesis on the country differences. However, coupled with other assumptions, hypotheses differ by context. Generally, openness of the system is a precondition for students re-enrolling upon the threat of status demolition. If the system restricts re-entries, status demolished students cannot re-enroll and have to seek other ways towards higher class positions.

In the US system, colleges charge in most cases at least moderate tuition fees. Colleges leading to better career prospects charge, in comparison to other countries, very high tuition fees. In Sweden, a comparatively generous system of student support exists. This system difference should favor status demolished young adults with upper class parents: in comparison to their peers in the same labor market position, the parents of status demolished young adults are more often able to give financial support and probably also more willing to finance additional education for their offspring - if the status maintenance motive applies. For Sweden I can thus expect the motive to avoid status demolition is more important.

Furthermore, another institutional factor has to be regarded. If young adults re-enroll to maximize their status position via education, they will more likely do so if education is a sufficient condition to enter high class positions with some certainty. And, even more important for the avoidance of status demolition, participation will be more likely if the respective education is a necessary condition to achieve the parental status. In systems with high average returns to education, but more importantly high certainty in these returns, re-enrolling is thus a more suitable strategy to overcome status demolition. The predictability of labor market outcomes differs between the two contexts. Due to the wage compression in Sweden, monetary benefits from higher education can be regarded lower, but not occupational class benefits. In the US, monetary returns can be expected to be higher, since taxation is lower than in Scandinavian countries (see Reisel, 2013 for a US-Norwegian comparison of returns to higher education). Class destinations on the other hand are more loosely coupled to education. Arum and Hout summarize the school-work linkage in the US in the following way:

> 'The weak to non-existent links between school and employers make the transition to work uncertain for US school-leavers. Those who first leave school before completing high school or immediately upon leaving high school seldom receive any institutional support in their job search. Many are disappointed by the outcome of that search and return to school. (…) Only those with post-graduate professional education can count on a circumscribed labour market to translate their credentials into an appropriate occupation. Even that narrowing of job tracks does not remove all of the uncertainties. The widest spread of earnings in first jobs is among the college graduates.' (Arum and Hout, 1998, p. 508)

Empirically, this link is somewhat tighter in Sweden, as Erikson and Jonsson point out:

> '… there is generally a substantial association between formal qualifications, on the one hand, and occupational prestige and social-class positions, on the other. This association is pervasive in that it exists in all subgroups identified by our structuring variables. Moreover, the effect of education on position is on the whole unmediated by industrial sector and firm size, although these factors have independent effects on labour-market outcomes.' (Erikson and Jonsson, 1998b)

Thus, as long as social class is the relevant outcome for status reproduction, Sweden can again be expected to show somewhat clearer and stronger effects of status demolition. This expectation is strengthened by a finding of Breen and Luijkx (2004), who identified Sweden among a large set of European countries as the country where the intergenerational transmission of class (and in particular the hierarchical element of the class scheme) depends most on education.

Taken together, the arguments though point towards one important aspect: Sweden is an even stronger test case for the relative-status-achievement mechanism compared to the US. As the higher education system is open and offers financial support, the remaining inequality is more likely to stem from individual preferences than from constraints. Inheriting the family status to the next generation is a motive, not a constraint. Its effect should thus appear more strongly in Sweden.

4.3.2 Methods

The methodology of this chapter differs in several respects to chapter 4.2. This has not only the aim of improving the comparability of the results over countries. It is also a replication and robustness check for the analyses presented there. The two datasets, the NLSY79 and the Swedish LNU, are used again as in other chapters before (cf. chapter 1.5). The NLSY79-sample differs from the previous chapter. Since the date of six months after starting the first job was the starting point of this analysis instead of the high school degree achievement date, it was possible to include one more cohort, the birth cohort of 1960. Furthermore, the inclusion of additional right censored cases, which had previously been excluded to have a consistent sample with chapter 3, led to a larger number of cases compared to chapter 4.2. For the US, only cases with high school diploma or GED were analyzed. For Sweden, the sample contains all life

histories of LNU. I did not restrict to those who qualified via secondary school, since re-enrollment into a college is – at least theoretically – possible for everybody and upper class children could use these opportunities more often.

Now I estimate Cox proportional hazard models (Cox, 1972), instead of accelerated failure time models as in all previous chapters. The difference is of technical nature and in general one would expect identical results, even though a number of assumptions differ. The shape of the hazard rate can be left unspecified so that the careful step by step modeling of the different hazard shapes, as I have done in sections 2 and 3, is not necessary. On the other hand, the Cox-model assumes that the hazard rates of different covariate values are parallel (ph-assumption), which has been violated in several previous analyses but is not as problematic for the core analysis on re-entry within this chapter. Furthermore, instead of an estimation of all covariate effects, I stratify the model by the relevant covariates which avoids assuming parallel hazards (Cleves et al., 2008, p. 194) and an equal absent violation of the ph-assumption for all covariates in all contexts. Ideally, this model could be extended into a fixed effects regression which is rather powerful in ruling out individual differences if multiple events per individual are measured (Cleves et al., 2008). The number of multiple re-entries is, however, small in the US and even smaller in the Swedish case and probably restricted to a very specific sub-sample and certain educational programs. Therefore, only the first re-enrollment is modeled (as in all other chapters before). The Cox proportional hazard regression will also be used in the next chapter 4.4.

For the analysis of re-enrollment, I now consider only the service classes and the intermediate classes. This is motivated by the fact that the skilled working classes could be downwardly mobile, but postsecondary education is in most cases no pathway up to the skilled working classes.

4.3.3 Results

The precondition for this study is that there is a sufficient number of status demolished young adults in both societies. If families all follow the strategy of maintaining their status directly without any detours, the group of potential re-enrollers would not contain any downwardly mobile youth and the relative status position to their parents cannot trigger re-enrollment. I therefore first illustrate the

occurrence of intergenerational downward status mobility over generations before continuing with regression analyses.

Figure 4.3.1: States in the school to work transition over 12 years following the first entry into the labor market: relative frequencies of young adults with status demolition compared with other states.

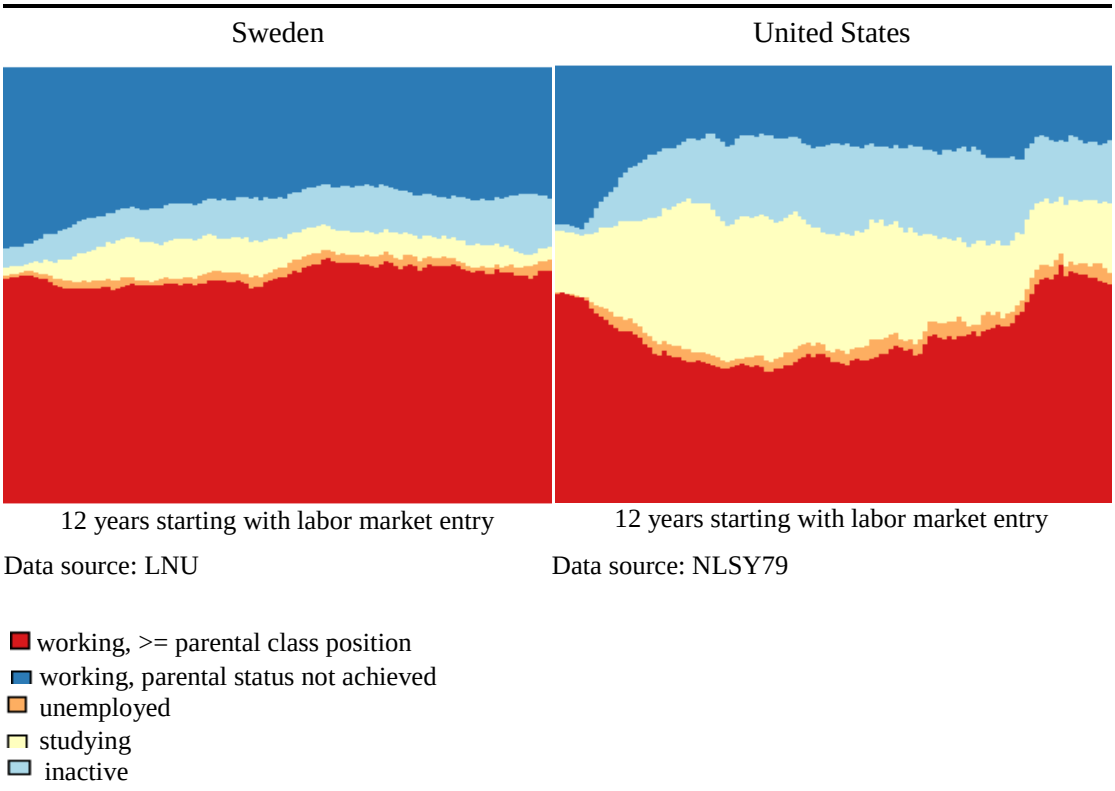


Figure 4.3.1 shows the activities of 12 years following the first entry into the labor market. In both countries exists a number of young adults who fall below the class positions of their parents, as indicated by the blue space on top of the graph. The share is even higher in Sweden, where the size of the status demolished population decreases much less over time. The smaller share of the activity 'studying' in Sweden can be partly due to the higher number of students who complete postsecondary education before entering the labor market. Another reason could be the less selective sample. While in Sweden all respondents are regarded as potential entrants, in the US only those young adults with a high school degree or GED are taken into account. For both countries, as figure 4.3.3 in the Appendix shows, the share of young status demolished young adults diminishes faster for those who re-enroll.

However, the state distribution plots in figure 4.3.1 cannot show the typical duration and stability of status demolition spells on the individual level. Figure 4.3.2 illustrates how stable status demolition is once it occurs in the two contexts. The starting point is the onset of actual intergenerational downward class mobility. Overall, the persistence is low. Upper class children seem to manage well to make their way back up to at least their parents' status. Also, in both contexts the service classes are most successful in overcoming intergenerational downward mobility even though the distance between their own and their parents' class can theoretically be the longest among all social origins[30]. The main country difference is the somewhat longer duration of the status demolition in Sweden. While in the US the vast majority of all spells ends soon, Swedish youth stays in lower positions for a longer time. However, status demolished young adults in the US have a higher number of spells in the lower class position. Once affected, the median number of repeated US is falling back into status demolition three times. In Sweden, the median recurrence of status demolition is only two spells. Therefore, in the lower part of figure 4.3.2 I plot the respective survivor curve until a person manages to overcome status demolition, i.e. until a job in the same broad class-category as ones parents have is found or education is entered. Becoming inactive, unemployed or entering another lower class job is counted as continuing status demolition. Now, the rate of those who overcome status demolition is smaller in both countries (note the short y-axis), but the US continues to be the case where revisions are realized faster and more often. Inequality is prevalent in Sweden. In the US, the intermediate and the service classes do not differ in the rate their children get out of status demolition, but the working class lacks behind (implying that the move back from the unskilled to at least the skilled working classes is less often realized).

Overall, the longer duration of status demolition spells in Sweden and the lower rate of overcoming strengthen the hypothesis above that status demolition triggers more re-enrollments into postsecondary education in this context. For the US, these spells are often shorter and more young adults manage overcoming status demolition after a while, most likely also via labor market mobility which is harder to

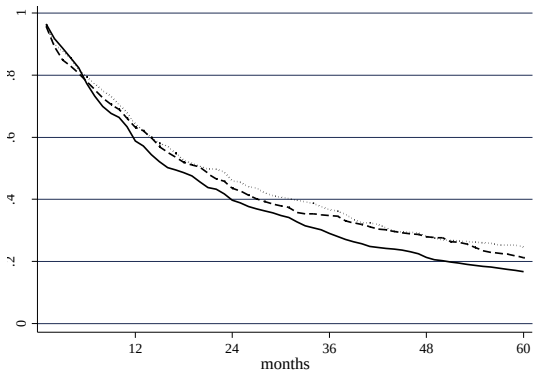
[30] Proportional hazard regression models show that the difference between both, lower classes and service classes is statistically significant at the 0.05-significance-level with the exception of the working-to-service-classes difference in Sweden.

achieve without additional education in Sweden. Then, education is more often needed as an alternative route out of lower class jobs.

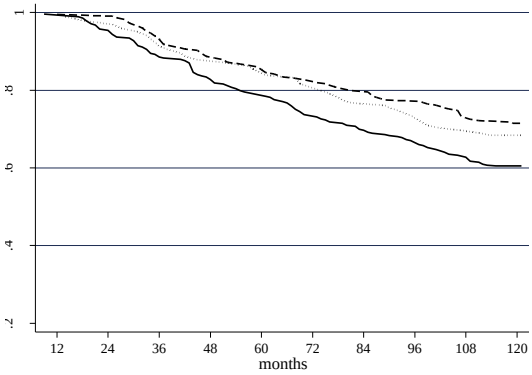
Figure 4.3.2: Survivor curves for the duration of intergenerational status demolition spells and status demolition in the life course.

Sweden

duration of status demolition spells



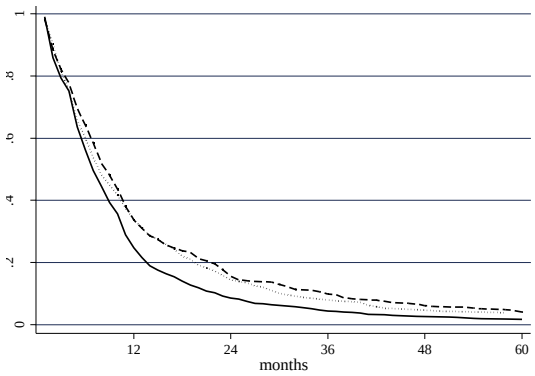
duration until overcoming status demolition



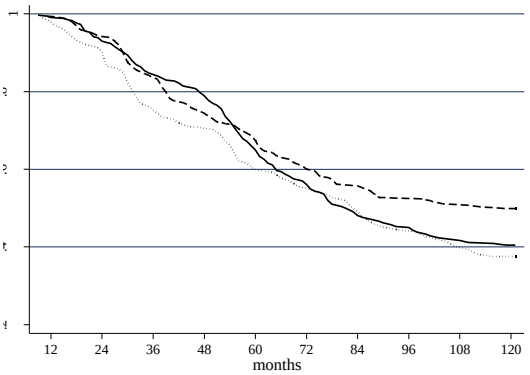
Data Source: LNU, not weighted

United States

duration of status demolition spells



duration until overcoming status demolition



Data source: NLSY79, not weighted

service classes
intermediate classes
working classes

For any further analyses I omit the working classes as moving back from the unskilled to the skilled working class should be largely independent from postsecondary education. The models I report differ from chapter 4.2, where I only included a dummy-variable for achieving parental status or not, Here, I include the

detailed actual class position of the respondent. This has the advantage of a much more detailed picture, whereas the test of the hypothesis on status attainment is diluted since each of the single coefficients lack statistical power. Based on these models, status demolished young adults re-enter the educational system, if at all, slightly more often than those who reach their parents' class directly. The current class position of the respondent is measure with a time lag of six months.

Table 4.3.1: Cox proportional hazard model of respondents own current class on the re-enrollment, by parental social class position, United States.

respondents current class:	**model 1** **family class: service class**	**model 2** **family class: intermediate classes**
service classes	*ref.*	*ref.*
intermediate classes	.17	-0.53*
skilled working classes	-.03	-0.17*
unskilled working classes	.05	-0.39
inactive	.21	-0.16
N	895	695

model stratified by / controlled for
- sex
- birth cohort
- age
- full eligibility to higher education
- race
- cognitive ability

time lag for class position of children: 6 months

Data source: NLSY79, own calculations.
*p>=.10; **p>=.05; *** p>=.01

Tables 4.3.1 and 4.3.2 present the results of proportional hazard regression models as described in the methods section. For the US, I now do not find evidence for the claim that young adults from service-class families would re-enroll more often when falling behind their parents' class. Even though the pattern is there, the single coefficients are no longer significant. For children from intermediate-class families most re-entries are observed for those who already have a service-class position (which are the reference category in all models). However, in support of the relative

status argument, re-enrollment is particularly low for those who have already achieved an intermediate class position.

Table 4.3.2: Cox proportional hazard model of respondents own current class on the re-enrollment, by parental social class position, Sweden.

respondents current class:	**model 1: family class: service classes**	**model 2: family class: intermediate classes**
service classes	*ref.*	*ref.*
intermediate classes	-.06	.21
skilled working classes	.27	1.42*
unskilled working classes	.35	1.85**
inactive	2.17***	3.32***
N	537	486

model stratified by / controlled for
- sex
- birth cohort
- first job permanent contract
- age
- full eligibility for higher education (via *Gymnasieskolan*)

time lag for class position of children: 6 months

Data source: LNU, own calculations.
*p>=.10; **p>=.05; *** p>=.01

For Sweden, the results are somewhat more clear-cut. While service-class children do not change their behavior if failing in status reproduction by becoming an intermediate class member, they do so when entering the skilled working classes and the unskilled working classes. Model 2 in table 4.3.2 shows the respective results for the intermediate classes. In this case, it turns out that those realizing positions below their parents' class re-enroll much more often.

The most remarkable difference between the countries is the role of postsecondary education for young adults becoming inactive, which is mostly unemployment for the respective group. In Sweden, this increases the enrollment into postsecondary education significantly, while the respective coefficients are non-significant for the US and even negative when the parents have intermediate class positions.

4.3.4 Conclusion

The analysis presented above has shown that the pattern of re-enrollment upon failure of parental class reproduction does occur in some instances, but stands statistically yet on weak grounds. Overall, it is also to admit that factual status demolition (as operationalized here) cannot explain much of social inequality in late educational enrollment. Possible explanations for the inability of the status maintenance mechanism to explain the real world observations without further modeling are manifold.

- First, it could be that the motive only exists for children, but not in the parents' minds. If that is true, late enrollment is the worst test case one could think of, as it is the transition at which children are most independent from their parents.
- Second, following on in the line of reasoning of the first argument, all effort for status maintenance would take place in earlier stages of the life course. Then, however, the question would remain open why inequality appears on these late transitions too. In particular for such contexts as Sweden and the US where educational decisions are generally moved to quite late parts of the life course. If any status maintenance occurs, even if only the parents pursue it, it has to happen rather late in the life course since there are few earlier opportunities for differentiation. However, several earlier educational decisions can prepare participation during the twenties, as section 3 could show.
- Third, rather than the maintenance of class, other outcome measures could be more important for young adults, such as reaching the same education, wealth or standard of living as the parents have achieved. All of this could be reached without a certain class position, at least in societies with a less tight link between education and occupational achievement. Then, completely new data would have to be collected. In the light of the continuing significance of occupations as the material basis for the standard of living, I argue, that even if this holds good a class effect would be present.
- Fourth, one could argue that first jobs are generally not meant to be permanent positions and thus not perceived as permanent and stable class positions. In this case, the assumption of myopia of educational decisions, which is

implicitly made, could be violated and re-enrollment is already planned when starting the job. This could be a likely explanation for both contexts; in particular for Sweden where permanent positions with unlimited contracts better define class positions. However, in additional analyses where I accounted for the contract type of the first job (temporary or permanent), the results do not change.

- Fifth, in particular for the service-class students the chances for securing parental status could be limited to high status, upper tier colleges. Re-enrollments into the lower tier colleges, such as community colleges, which are frequently entered by non-traditional students, could be useless for them. Then, late education could be speculated to be a generally useless instrument for status maintenance of service-class children, since the class positions they aspire would require demanding and long educational programs. This calls for further analyses restricting re-entry to more demanding, higher prestige colleges.
- Sixth, the reason could lie in the specific composition of young adults entering the service class. They could be particularly likely to enroll again for other reasons – and also into other programs. For them, higher education could pay off more and could be a method of individual career advancement, independently from their social origins. Factors behind this could be that they were previously successful in schooling, or that their employers encourage them to re-enroll. Then, the generally higher re-enrollment would counterbalance the status maintenance motive among the service-class children. If service-class children who have not achieved such a position themselves re-enroll more often due to status demolition, it could still be that those who have managed to enter the service class re-enroll frequently for other reasons and we cannot observe the status demolition effect. In this case, the effects of status demolition must become visible in a clearer way among the intermediate classes, for whom the coefficients do indeed support this hypothesis in a much clearer way for both countries.

Overall, the long list of possible explanations for the results should encourage further research on individuals whose status reproduction has come under pressure. In particular explorative research about strategies which are followed if re-enrollment

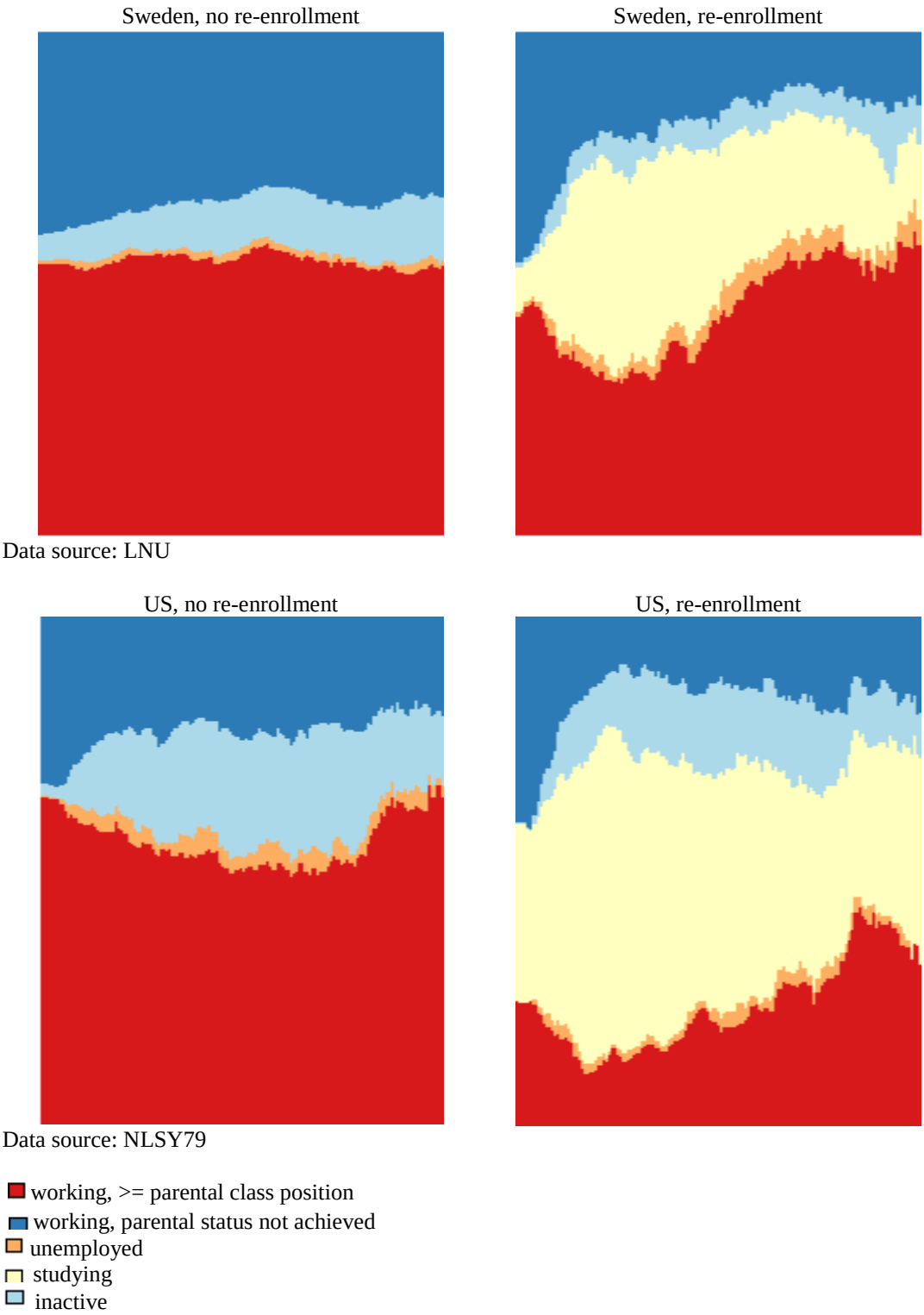
into education is not chosen could be useful to further enlighten the mechanisms behind intergenerational inequality.

The country differences are in line with my expectations outlined at the start of this chapter. The relative status demolition can be observed better in the Swedish sample, in particular among the intermediate-class children. This supports the view that the cost argument is more important in the US, and hides some of the status maintenance mechanism. Furthermore, there is another indication that the costs of higher education are an important deterrent for American non-traditional learners. While in Sweden inactive (mostly unemployed) young adults react with re-enrollment on this situation, there is no link between inactivity and re-enrollment in the US. The Swedish combination of openness of the higher education system to non-traditional students and its low costs seems to offer chances for youth in problematic labor market situations, while the US system deters exactly those who are in financial needs by the high costs of education.

The chapter, even though the analysis could not arrive at a final conclusion, shows that also micro-level explanations can be sharpened when their effectiveness is compared over different societies. Even though the difficulties of observing the consequences of status demolition occurred again as in chapter 4.2, the results for Sweden could add some support to this explanation. Costs as a deterrent from higher education are easy to understand in their implication for individual behavior on the one hand and comparatively easy to manipulate by policy makers on the other hand. It seems that the low-cost Swedish system is more successful in activating inactive young adults.

4.3.5 Appendix

Figure 4.3.3: States in the school to work transition over 12 years following the first entry into the labor market: relative frequencies of young adults with status demolition compared with other states, by participation in postsecondary education (any participation yes/no).



Data source: LNU

Data source: NLSY79

In figure 4.3.3, I plot shares of the different activities as in figure 4.3.1 separately by educational attendance over the 12 years after the first entry into the labor market. What it shows immediately is a bivariate relationship between educational attendance and a faster reduction in the share of status demolished students in both societies for those who re-enroll in postsecondary education.

4.4 The Long Arms of Parents? Mothers' and Fathers' Social Class and Inequality among Men and Women in Belated College Entry throughout the Life Course in the US

This chapter differentiates social origin effects on late enrollment by bringing in a gender and a life course perspective. I describe the re-enrollment process in its dependence on the parent's and the children's sex. Results show that for children the father is the more important reference in defining social origin, while mothers' class brings in additional information. Re-enrollment, however, is more sex-specific on the part of the children. Lower class sons enroll less often than their upper class same-sex peers into postsecondary education over the entire life course. Daughters from the lower classes catch up somewhat via late enrollment. This last finding of decreasing class inequality among women over time is then the motivation for chapter 4.5. There I seek to explain this pattern and will test several hypotheses. However, the pattern persists even if a large number of alternative explanations are taken into account by statistical control.

This chapter is based on the following article:
Weiss, Felix and Mirte Scholten (2012). 'Gender differences in the influence of parental class on young adults' participation in postsecondary education in the US' *Journal of Further and Higher Education,* Online First.

4.4.1 Introduction

The gender perspective has always accompanied studies on educational inequality based on social origin. Classical studies in the area already showed that there are correlations between processes of educational achievement as well as status attainment and sex (Blau and Duncan, 1967 Ch. 5). In recent work on intergenerational inequality, this aspect has got a great deal of attention (Buchmann and DiPrete, 2006; Korupp, Ganzeboom and Van Der Lippe, 2002; Meraviglia and Ganzeboom, 2008). Late educational decisions ought to be even more sex-specific as women and men differ remarkably in their typical life course pattern with regard to work and parenthood (Bradburn, Moen and Dempster-McClain, 1995; Taniguchi and Kaufman, 2007).

Instead of following on with the testing of more explicit mechanisms on the

micro-level as the previous three chapters, this chapter extends the inequality perspective in two ways. First, it refers to the gender specificity of social inequality in late enrollment. Gender role socialization is hypothesized to lead into different patterns for women and men. The chapter describes the influence of the social class of fathers and mothers on the re-entry into education of women and men over time, drawing on a study published in collaboration with Mirte Scholten (Weiss and Scholten, 2012).

Late enrollments are a suitable situation for testing hypotheses based on the idea of gender role socialization. Many educational decisions are made by the parents on behalf of the child, or parents at least have a strong influence on these decisions. In contrast to earlier educational decisions, the question of whether the mother or father serves as a 'role model' or 'status reference' for re-enrollment is a question about the guiding factors of the child's own choice.

4.4.2 The Sex-Specific Late Participation in Postsecondary Education – do Fathers' and Mothers' Long Arms Reach their Sons' and Daughters' Lifelong Learning Behavior Differently?

Over the last decades, women's participation in education and the labor market has increased in industrialized western countries. This has given rise to doubts about the accuracy of the father-centered approach in defining social origin (Meraviglia and Ganzeboom, 2008). The gendered nature of the life course makes this issue particularly important for the study of delayed or 'second chance' entrance into education. Without considering the mother's class position, an important aspect of intergenerational status transmission might be missed. I empirically compare several models and hypotheses for the explanation of sex-specific class inequality that have been proposed in the literature. The aim of this endeavor is to compare the role of the social status of mothers and fathers on their daughters' and sons' re-enrollment in college after starting their working lives, in order to improve our understanding of the relationship between the child's educational attainment and the parental class position and gender. In addition, I will describe the development of the parental class effects on the child's enrollment over the life course applying event history models on the NLSY79 data.

The findings show that the fathers' class position in general leads to broadly the same conclusions with regard to intergenerational inequality, but other

operationalizations are more accurate. For sons, the influence of parental class remains constant throughout their lives. For daughters, it changes with age. While working-class daughters are disadvantaged at the beginning, 30 months after labor market entry they start enrolling more often than the most privileged group, the service-class daughters. This pattern of switching class coefficient among women over the life course motivates an additional analysis in chapter 4.5 which aims at testing several explanations for it.

While class is still an important determinant of educational achievement, the disadvantages of women in educational achievement decreased in the US over the last decades of the 20th century; including the disadvantages in higher education (Buchmann, DiPrete and McDaniel, 2008; Roksa et al., 2007). Not only the increasing participation of mothers in the labor market, but also the increasing participation of daughters in the educational system makes the question of the role of mothers a more important one. As well as the question whether there is a specific role of parental class for educational achievement of their daughters. A debate about the parents' role in intergenerational inequality, especially that of mother's, has already given rise to criticism of the 'conventional approach' to take only fathers' class position into account. Suggested alternatives are the 'dominance approach', the 'individual model' and the 'sex role model', all proposing a certain definition of social origin beyond fathers' class.

Erikson (1984) proposed including women's socioeconomic status in the model according to the rule that the 'class position derives from the occupation of the spouse who has the 'higher' (or dominant) position in the labor market' (Meraviglia and Ganzeboom, 2008, 34). Consequently, this *dominance hypothesis* predicts that the mother's class position matters as long as she has a higher occupational status or class than her husband. However, other possible mechanisms related to the occupational class position of the mother, such as cumulative wealth of double-earner families, are not regarded as important.

The *individual hypothesis* argues that the class position of both parents generates intergenerational inequality and the educational and occupational status of each parent best represents the socioeconomic background of their children (Acker, 1978; Johnston, Ganzeboom and Treiman, 2005). Hence both parents independently have an impact on their child's educational achievement. The following model

assesses the full influence of social origin and proposes that the mothers' position is an additional, independent source of social inequality.

Finally, the *sex role model* offers the most precise expectations about the importance of both parents and also explains gender differences on the part of the child. The idea builds on studies showing that the child regards the same-sex parent as the person to imitate when forming her/his identity (Smith and Self, 1980; Updegraff, McHale and Crouter, 1994). Other than the earlier hypotheses, it refers to socialization as an explicit micro-mechanism. Children are socialized according to the roles of their parents (Korupp, Sanders and Ganzeboom, 2002, 12). Transferring this to the decision to re-enter the educational system, the hypothesis can be derived that daughters' educational attainment will be more influenced by their mothers', and sons' by their fathers' status. This does not contradict the fact that the other parent has an independent influence on educational choices of the child, but specifies which parent is the more important reference. According to the role model mechanism, non-working mothers should guide their daughters towards household work and, consequently, to lower rates of (re-)enrollment. This does not apply to sons. The role model socialization explanation can only be true for decisions that are made by the student him-/herself and not by the parents. If parents decide about their child's participation in an educational program, the socialization of the child is irrelevant for his or her educational achievement and the students' own motives do not matter. Previous empirical research has shown that the sex role model is valid for the sex typing of educational choices in terms of fields and specializations, but not for the hierarchical status achieved (Dryler, 1998; Korupp, Sanders and Ganzeboom, 2002). The older the children, the more independence from their parents can be assumed. Although parental advice might still play an important role, the goals and ideas of the children become more and more important. Young adults who have already worked for some time should be more independent from their parents than younger children. Furthermore, the financial resources of young adults increase and, therefore, the dependence on their parents' wealth decreases. Now, the role model mechanism can become more important even for the amount of education achieved, and not only for horizontal dimensions. This makes the re-enrollment decision a viable test case for the sex role model.

As in the last two chapters, I distinguish two mechanisms accounting for class inequality in educational decisions: (a) performance-based, primary effects of

social origin, and (b) the secondary effects of social origin that can be attributed to a difference in decision making between social classes (Boudon, 1974). This differentiation is important when assessing the sex role model. The mechanisms proposed here are again secondary, decision based effects.

4.4.3 Data and Methodology

Again, the database for this analysis is NLSY79 (U.S. Department of Labor, 2008). The sample is reduced to the cohorts born between 1961 and 1964. Further, I only use respondents with a GED or high school degree from the main, nationwide cross-section sample. The central independent variable 'social origin' is measured by a simplified version of the EGP (Erikson, Goldthorpe and Portocarero) class scheme (Erikson, Goldthorpe and Portocarero, 1979; Goldthorpe, 2000)[31]. The classes are grouped in the same way as in chapter 4.2, into a simplified scheme documented in table 4.4.1 for two reasons: first, to avoid the estimation of coefficients for very small categories; second, and more important, classes in the simplified version can be ordered hierarchically. In order to construct the dominant or 'maximal' class out of both parents, this is crucial. In addition to the working population that is covered by the EGP class scheme, I include the categories 'inactive' for non-working parents and 'absent' for parents not living in the household. The 'inactive' category is particularly large for mothers (48 percent).

[31] One could argue that, based on the socialization mechanism, parental education should be what is really transmitted from the parents to the child. I have theoretical concerns about this argument. While parental education is indeed more useful as a direct model for the child's educational decision, parental occupation is more salient in everyday life and hence should be at least as important for socialization as parental education.

Table 4.4.1: EGP class scheme and simplified version.

full EGP class scheme categories		simplified class version
I	professionals and managers, higher grade	service (1)
II	professionals and managers, lower grade; technicians, higher grade	service (1)
IIIa	routine non-manual employees, higher grade	intermediate (2)
IIIb	routine non-manual employees, lower grade	skilled working (3)
IVabc	small employers and self-employed workers	*assigned to other classes according to occupation*
V	technicians, lower-grade supervisors of manual workers	intermediate (2)
VI	skilled manual workers	skilled working (3)
VIIa/b	non-skilled manual workers	unskilled working (4)
inactive		inactive (5)
absent		absent (6)

As the main interest is the differentiation of effects by different origin and over time, I keep the number of control variables smaller than in the previous chapter. This bares the danger of not controlling completely, e.g. for primary effects. Estimating more complex models such as the piecewise effects models on the other hand could be too demanding with more variables and the given sample size. I do not restrict the age of the respondents to a certain limit. However, right-censoring occurs in 2006, when the respondents are between 41 and 45 years old. To cancel out primary effects, only the 'Armed Forces Vocational Aptitude Battery' (afqt score) is included into the models. The score is a weighted average of test scores, such as scores of arithmetical reasoning, numerical operations, word-knowledge and paragraph-comprehension. In order to capture the different financial situation of families from different social origins at about the time of the child's graduation from high school, household poverty status according to the guidelines issued by the US Department of Health and Human Services is included as well. This variable is measured when the respondent was eighteen years old. Race (white and other, black, Hispanic) and birth cohort are controlled for to avoid misinterpretations due to affirmative action (cf. Grodsky, 2007) or cohort-specific macroeconomic and social conditions. The distributions of all variables are summarized in table 4.4.5 in the Appendix of this chapter.

By means of the definition of the dependent variable all cases not entering the labor market for at least six months before completion of a college degree (B.A. or

B.Sc.) are irrelevant, since the role that re-entry plays for their educational achievement is different. Altogether, the usable sample contains 2,698 cases which were reduced further to 2,394 when excluding all cases with missing values ('listwise deletion').

The remaining sample is a selective sample, probably also with regard to the tendency to partake in education. On the other hand, those students entering college directly did not have the choice to re-enter later, so they were not in a position to decide whether to re-enter or not. Using this criterion furthermore ensures that young adults had already been part of the labor force and had therefore gained a certain level of independence from their parents. In addition, by selecting young adults who generally tend to participate to a lesser degree in postsecondary education, my results can be seen as conservative estimates of the existence of differences by social origin.

4.4.4 Statistical Models

The analysis of the transition rate from employment to being a college student is based on Cox´s proportional hazard models which were also used in chapter 4.3 (Cox, 1972). While all previous models had to tackle the problem of non-proportionality of the central independent variables, for analyzing the development of the effect over time, the Cox-model is the better choice. Changing effects of an independent variable over time implies non-proportionality, which is modeled explicitly by period-specific effects (Bernardi, 2001). Furthermore, the Cox-model overcomes the problem of specifying a parametric function for the hazard rate.

The observation period starts when young adults enter the labor force (for at least 25 hours per week) and for at least six consecutive months. I split the time axis into two time periods, before and after the 24th month of time at risk (which is then the 30th month in the labor force, if employment continues). I split the time axis after this period since I assume that after this time young adults are independent from their parents and can make their own living[32]. Finally I want to distinguish how well the different operationalizations of parental class predict the behavior best with as little information as possible, i.e. how well the models fit. For a comparison of the model fit I refer to Bayes' information criterion (as described below).

[32]As a consequence, the proportionality assumption is now only made within these sections of the process time. Further, this choice was subject to comprehensive robustness checks. Shifts of the splitting point by one year do not alter the findings.

4.4.5 Results

Starting the empirical analysis, I present a model similar to the ones from the comparative study in section 3 or chapter 4.2 using the present sample and the Cox-model. However, now all analyses are carried out separately by the sex of the child. This gives justice to the expectation of the sex role model, namely that it depends on the sex of the child which parent determines the more important class reference. The service classes are the reference category throughout all models. That means that all class coefficients are effects of an underlying comparison of the respective class group with the service classes. Each model is estimated as a bivariate model of class and re-entry and after controlling performance and compositional effects. As the focus lies on the class differences in decisions and due to restrictions in space, I only report the bivariate models for the operationalization of conventional hypothesis. Note that all those bivariate models left out would have led to the same conclusions as the full models reported here.

4.4.6 Cox Models with Time Constant Effects

As a baseline, I reproduce the models from previous chapters, but defining the parental class according to the conventional approach as fathers' class (table 4.4.2, model 1). In comparing men and women, only the coefficients for sons are statistically significant, while the influence of fathers' class on daughters is much smaller and insignificant. Daughters are seemingly much less influenced by their father's class position in their decision about re-enrolling. All class categories in the sample of sons have positive coefficients, and hence the event 're-enrollment' occurs later or less often than for service-class children, which is the reference category. However, these class differences are only statistically significant for the comparison between the 'working classes' and inactive fathers on the one hand and the service classes on the other hand. When holding race, poverty status, aptitude (afqt percentiles) and birth cohort constant, the coefficients for sons still show the same tendency, but are only significant for the working classes. That means, when controlling statistically for variables which have a direct relation to college entry and represent certain mechanisms, sons from a lower class background still have a lower re-entry rate; even though much of the effect in the first model is attributable to the

variables introduced in the second step.

Table 4.4.2: Cox proportional hazard model – only father (conventional hypothesis) – father and mother (individual hypothesis), for sons and daughters, log hazard ratios.

	model 1: conventional hypothesis				**model 2: individual hypothesis**	
explanatory variables	**sons**		**daughters**		**sons**	**daughters**
fathers' class						
service classes	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*
intermediate	-0.27	-0.16	-0.12	-0.07	-0.14	-0.09
skilled working	-0.32*	-0.21	0.08	0.17	-0.18	0.13
unsk. working	-0.81*	-0.59*	-0.09	0.08	-0.57*	0.06
inactive	-0.54*	-0.25	0.33	0.39+	-0.24	0.37+
no man present	-0.18	-0.09	0.08	0.22	-0.07	0.16
mothers' class						
service classes					*ref.*	*ref.*
intermediate					-0.26	0.02
skilled working					-0.25	0.20
unsk. working					-0.26	-0.03
inactive					-0.18	-0.14
no woman present					0.36	-0.47
race						
white + other		*ref.*		*ref.*	*ref.*	*ref.*
black		0.57*		0.28	0.58*	0.28
hispanic		0.61*		0.53*	0.60*	0.58*
cohort						
born 1961		*ref.*		*ref.*	*ref.*	*ref.*
*1962		0.22		-0.01	-0.16	0.37*
*1963		0.31+		-0.11	0.04	0.34*
*1964		0.18		-0.36*	0.13	0.24
afqt score		0.01*		0.01*	0.01*	0.01*
poor		-0.30+		-0.04	-0.33+	-0.02
N	1239		1155		1239	1155
no. of failures	306		394		306	394

Data source: NLSY79, own calculations; + p < .10, * p < .05

Model 2 in table 4.4.2 then further includes the mothers' class position, as suggested by the individual hypothesis and the sex role hypothesis. Adding the mother's class position does not alter the basic conclusion of the role of the father's class position.

The fathers' influence remains only statistically significant for the unskilled working classes. At least for sons all coefficients are negative. This can be seen as support for previous studies pointing to the importance of the mothers' class for intergenerational mobility (Korupp, Sanders and Ganzeboom, 2002; Korupp, Ganzeboom and Van Der Lippe, 2002; Meraviglia and Ganzeboom, 2008). However, in contradiction to the sex role model, the conclusion must be limited to sons, while daughters are neither influenced by their father's nor by their mother's class. Furthermore, when holding performance differences by social origin constant (primary effects) the effects of the mothers' class on sons are not significant, while there is a clear effect of fathers in the unskilled working class. This could be a hint that the mothers' influence relates more to the development of the scholastic performance of the child, while the father's class directly influences the decision to enroll.

Table 4.4.3: Cox proportional hazard model – maximal class (dominance hypothesis) for sons and daughters, log hazard ratios.

	model 3	
explanatory variables	**sons**	**daughters**
maximum class		
service classes	*ref.*	*ref.*
intermediate	-0.32*	0.01
skilled working	-0.40*	0.19
unskilled working	-0.51*	-0.02
Inactive	-0.02	-0.00
race		
white + other	*ref.*	*ref.*
black	0.57*	0.34*
hispanic	0.61*	0.58*
cohort		
born 1961	*ref.*	*ref.*
*1962	-0.19	0.36*
*1963	0.02	0.33*
*1964	0.14	0.25
afqt score	0.01*	0.01*
poor	-0.33+	-0.02
N	1239	1155
no. of failures	306	394

Data source: NLSY79, own calculations.
+ p < .10, * p < .05

The last operationalization follows the rule of the dominance hypothesis and measures social origin as the higher status of both parents in the ordered 4-class scheme. Once non-working parents are present, the dominant class is defined by the person who works. Present parents are always given priority over absent parents. The effects on sons are again stronger in the case of lower classes – the origin effects are even stronger than before.

For all models it is noteworthy that the AFQT percentiles – as a measure of aptitude – increase the tendency to re-enroll, while household poverty is not significant when keeping all other variables in the model constant. The absence of social class effects on daughters comes as a surprise. In the next section I turn to more complex models showing that this is due to misspecification of the proportionality assumption of the model.

4.4.7 Piecewise Constant Cox Proportional Hazard Model

As the proportional hazard assumption is violated all over in the female sample, but not in the case of men, I now specify separate coefficients for different sections of the time axis. This relaxes the proportional hazards assumption to such a degree that it only has to be met within one 'time section'. For each covariate, there is one coefficient showing the hazard rate of re-enrolling during the first 24 months of time at risk (that is the first 30 months after the first school-to-work transition). Another coefficient shows the influence on the re-enrollment rate for the remaining time in which we observe the case. Table 4.4.4 shows the results of such a model using the *dominance hypothesis*-operationalization of parental class separately by the sex of the child. Again, sons with a service-class parent re-enroll most often in both periods. All class coefficients for sons show the same tendency as in the previous models and they do not yield additional insights compared to the time-constant models. This means that such a complex model is not necessary for sons. The situation is different for daughters. All lower-class daughters tend to re-enter less often than service-class daughters in the first 30 months of labor market participation. After this period the daughters of lower-class fathers re-enroll more often in contrast to the reference group. In other words, during the first 30 months in the labor market, the effects are as expected from previous research (lower rates for lower parental classes). But thereafter class inequality is reversed. This result shows that the 'over-the-whole-process-time' coefficients in the previous models were a wrong specification of the true process, and daughters are in fact influenced by their parents' class position[33].

[33] The switching of the coefficients is not altered when including the class position of both parents individually in the model; instead, only the coefficients for the fathers' class are significant (model not shown here).

Table 4.4.4: Proportional hazard model with time varying coefficients – maximal class (dominance hypothesis) for sons and daughters, log hazard ratios.

explanatory variables	**sons**	**daughters**
time: 24 months	3.95	1.00
max. class		
service classes	*ref.*	*ref.*
intermediate, until 24th month	-0.53+	-0.21
after 24 months	-0.23	0.19
skilled working, until 24th month	-0.30	-0.72*
after 24 months	-0.46*	0.63*
unskilled working, until 24th month	-0.31	-0.36
after 24 months	-0.62*	0.23
inactive, until 24th month	-0.05	0.09
after 24 months	-0.04	0.01
cohort		
born 1961	*ref.*	*ref.*
*1962, until 24th month	-0.39	-0.13
after 24 months	0.55*	0.04
*1963, until 24th month	0.02	-0.41+
after 24 months	0.53*	0.06
*1964, until 24th month	-0.16	-0.54*
after 24 months	0.43+	-0.25
Race		
white + other	*ref.*	*ref.*
black, until 24th month	1.19*	0.32
after 24 months	0.17	0.35+
hispanic, until 24th month	0.97*	-0.20
after 24 months	0.35	0.88*
afqt scores, until 24th month	0.02*	0.01*
after 24 months	0.01*	0.01*
poverty at age 18, until 24th month	-0.43	-0.43
after 24 months	-0.26	0.11
N	1239	1155

Data source: NLSY79, own calculations.
+ p < .10, * p < .05

4.4.8 Summary and Conclusions

The results presented in this chapter so far show that sex is an important mediator in the process of late educational decisions, although the relationship is quite complex. My main aim however, was to test different operationalizations of the parents' class positions against each other. In summary, the findings are somewhat in favor of the dominance hypothesis, since the small sample size requires a parsimonious measure of social origin. Including information on the mothers' status in the way the dominance hypothesis suggests does not add additional explanatory power to the model. The conventional hypothesis, which only considers the fathers' occupational class, can on the other hand be seen as a strong simplification. If the mothers' occupation is available in the data this can easily be avoided by using the dominance approach.

As an additional result, it turned out that sex differences on the part of the child are important beyond the exact definition of social origin. Sons and daughters clearly differ in their educational participation once they are integrated into the labor market. While for sons class origin remains influential throughout their lives, the influence on daughters' changes with time. Service-class sons are more willing to give up their job to return to school. Service-class daughters are at first advantaged, but then the picture changes. In the second period, service-class daughters return less often to school than working-class daughters. None of the theoretical models I discussed can explain this pattern. The sex role model is to some degree justified by its emphasis on the sex of the child. But in contrast to the sex role model, daughters are more influenced by their fathers (as shown in a model with both parents' class position which I do not report here), but not persistently over time. A more systematic comparison of the different models of parental background operationalizations is needed to judge their explanatory power. To achieve this I calculate fit statistics accounting for the number of model parameters; the Bayesian Information Criterion (BIC). Since the results are not of central interest for this chapter, the results are presented in the Appendix (table 4.4.6). In essence, this analysis shows that the dominance approach represents a good compromise between taking mothers' class information into consideration and the parsimony of the model.

Up to here, this chapter compared the mothers' and the fathers' class in their impact on late re-enrollment decisions of their sons and daughters. Starting with a

model assuming that the effects are constant throughout the entire observation period, I found disadvantages only for sons of unskilled working-class fathers compared to their service-class peers, but not for daughters. Specifying the model differently with separate coefficients for two time periods confirms the finding for sons and reveals a more complex pattern for daughters. While the inequality pattern is persistent throughout the life of men, working-class women are first disadvantaged in comparison to their service-class peers. Later, they catch up to some degree. This pattern has not been expected by any of the models discussed and calls for theoretical elaboration by further research. Attempting to explain this pattern will be subject of the next chapter (4.5).

4.4.9 Appendix

Table 4.4.5: Distribution of explanatory variables.

	mean (SD) %
mothers' class	
service classes	9.48
intermediate	16.17
skilled working	15.54
unskilled working	12.61
inactive	45.07
no woman present	1.13
fathers' class	
service classes	21.55
intermediate	12.16
skilled working	21.93
unskilled working	23.77
inactive	5.97
no man present	14.62
race	
white + other	82.21
black	11.28
hispanic	6.52
cohort	
born 1961	25.81
*1962	26.78
*1963	25.31
*1964	22.10
afqt scores	51.37 (27.10)
living in poor HH at 18	19.13
N (persons)	2394

Table 4.4.6: Bayes' Information Criterion for different operationalizations of social class origin.

	Cox-model		piecewise constant model	
	(bivariat)	(full)	(bivariat)	(full)
son				
only father	4230.0	4220.6	4257.1	4273.2
only mother	4244.4	4228.7	4267.2	4275.8
both parents	4252.9	4246.3	4302.9	4320.2
maximum class	4223.3	4214.5	4244.4	4260.7
daughter				
only father	5362.9	5370.6	5373.6	5408.7
only mother	5360.7	5368.9	5382.6	5417.3
both parents	5385.7	5394.0	5421.7	5456.2
maximum class	5359.2	5367.3	5360.5	5395.4

Data source: NLSY79, own calculations.

The log-likelihood (LL) is used as deviance statistics. A larger BIC will result either from a larger deviance of the model from the real data or a larger number of model parameters weighted by ln(number of events) (Singer and Willet, 2003). Therefore, smaller values of BIC indicate a better model fit including a 'penalty' for less parsimonious models with more parameters (i.e. more independent variables). Table 4.4.5 summarizes the findings.

Models referring to the fathers' occupational class fit better than those referring to the mothers' class only. This finding is very clear in the case of sons. There is almost no difference with respect to the BIC for daughters in the Cox-model without time split. I discussed the problematic role of this model for daughters earlier on: the influence of social origin changes over time, and hence the piecewise constant model is a much better basis for a comparison between models. When judging the appropriateness of the models strictly on the basis of the BIC-statistic, even for women a model with fathers' class only would be preferred over a model operationalizing social origins as mothers' class position. The value of the BIC for the 'mother only' model is higher than for the 'father only' model. This indicates that even for daughters, fathers' class predicts educational attainment better than mothers' class position which contradicts the sex-role model. Furthermore, for sons and daughters the piecewise constant models estimating the maximum class produce the smallest BIC value. It should be noted again that the process of inequality in re-entry for women can be captured best by a piecewise constant model, although the BIC values are larger than those for the simple models due to the larger number of coefficients. But these larger values of the BIC do not take into account the fact that the true influence of social inequality can only be uncovered when modeling its time dependence. Again, the best-fitting representation of social origin is one that includes both parents by always using the higher

class position. Taking both parents separately, the father is the better representation of social origin than the mother.

In the literature, several hypotheses have been put forward challenging the conventional approach of only referring to father´s class as operationalization of social origin. I have applied the individual model treating father and mother separately, the dominance model which always refers to the highest status out of both parents and the sex role model which proposes that children are influenced most strongly by the same sex parent. The results suggest that mothers' status matters for young adults' decisions about educational re-entry. Thus, the conventional approach does not capture the full extent of the influence of family origin on young adults' educational decisions. If, however, no other information is available it leads to broadly the same results as those measures which include the mother's class. The dominance hypothesis, which defines social origin as the highest position out of both parents yields a clearer picture of social origin differences. Furthermore, as the number of variables needed to define social origin is the same as in the conventional approach, the model is equally parsimonious and leads to a better model fit. The individual model is more complex and thus, although it reveals additional insights on the extent to which the mother contributes independently, results in a less parsimonious model. There are only small and non-significant effects for the mother's in addition to father's class. The sex role model brings the sex of the child in. Differentiating between the sons and daughters and social origin effects on late college entry does indeed lead to different results. However, the hypothesis that the same sex parent is always the more important reference cannot be supported. While for both sexes the father is the major status reference, social origin differences in college enrollment throughout adulthood differ between men and women.

For data collection, these findings imply that it is beneficial to know about the mother's position and to concentrate only on the father's position would lead to a loss of information. As the data cannot be changed, one will however most likely find a rather similar story if we know only about the father's position. It is also interesting, that the mother's position does matter in addition to the fathers' position, even though to a lesser degree. This confirms a more general finding from the literature (Buchmann and DiPrete, 2006; Meraviglia and Ganzeboom, 2008) of intergenerational mobility on the specific question of belated entry into college. Including mothers into the analysis of intergenerational mobility is furthermore likely to become more important in the future as female employment, especially in higher status positions, is becoming more frequent.

4.5 Why are Working-Class Daughters More Often Re-Enrolling than Service Class Daughters? Some Attempts to Explain a Finding of Chapter 4.4

The finding of decreasing class inequality among women over time from chapter 4.4 is the motivation for this chapter. I seek to explain this pattern and will test several hypotheses on the specific life courses of working-class women – both related to their early disadvantage and to life-events in which they might be more often involved than service-class daughters. However, the pattern persists even if a large number of alternative explanations are taken into account.

4.5.1 Explaining Women's Diminishing Educational Inequalities over the Life Course

Chapter 4.4 has revealed one result which came as surprise given the broad stream of findings showing that inequality continues to be to the disadvantage of working-class children over the life course – beyond the regular school career. As analysis in chapter 4.4 show, origin effects on re-enrollment into college are highly gender specific in the US. The entry rate into college is lower for working-class women in comparison to their service-class female peers in the first months. After some time in the labor market, however, working-class women catch up with upper-class women to some degree. For men on the other hand, social origin effects are stable over the life course and lower class sons receive less education. Women from working-class origins showed after an initial disadvantage a higher entry rate into college. A different pattern was found among men, where the disadvantage of the lower classes continues over a long period in the life course. This chapter aims at explaining the results for the women and testing a number of possible explanations using the same dataset and the same conceptual framework and methodology as in chapter 4.4.

I consider three groups of mechanisms: first, explanations for the switching of class coefficients for women referring to the selection into the group entering the workforce without a college degree. Second, explanations rooted in sex and class

specific biographical events. Finally, changing macro-conditions along with the aging of the NLSY79-cohort in favor of women's participation in higher education and biographical events.

4.5.2 Selection of Young Working-Class Women into the Group of Potential Re-Entrants?

The high working-class enrollment rate among those women, who already worked for several years, could be due to particularly strong educational aspirations among working-class women in this group. A reason for a higher share of highly motivated women among the working-class daughters could be that they were particularly often prevented from enrolling earlier, while service-class daughters can realize their plans right after high school. Assuming such a selection mechanism raises new questions. Why does this strong selection only occur for working-class women, but apparently not for men? And why do upper class women more often enter college directly than working-class women?

Most research on occupational and educational aspirations scrutinizes either on the relationship between gender and occupational or educational expectations or on the effect of socioeconomic background on occupational or educational aspirations. Marks (2010) as well as Mau and Bikos (2000) find that women express higher occupational expectations than men. Hyman (1966) and Lipset (1955) attributed the positive correlation between student's aspirations for occupational prestige and the social status of the family to values for achieving the parental occupational status position. This is in line with earlier studies conducted by Sewell et al. (1957), concluding that parental class values influence children's educational and occupational aspirations. The authors suggest that social class makes an independent contribution to occupational aspirations (Sewell, Haller and Straus, 1957:73). This asymmetry could lead to the finding of switching coefficients among women due to a combination of lower chances for working-class children but at the same time higher aspirations among women. However, only if the sex and class do not interact and in addition the following two things are given: first, all young adults from the working classes, women and men, are disadvantaged with regard to entry into higher education right after high school to the same extent and second, women have on average higher aspirations for occupational achievement and therefore those from the working classes

catch up more often than men. This is fuelled by the higher share of working-class children with unfulfilled class aspirations among women (Hypothesis 1a).

Moreover, besides deterrents affecting the entire population of working-class young adults, there could also be mechanisms which specifically affect working-class women. One such factor could be early family formation of working-class daughters. Early pregnancies or marriages can limit women's mobility. In line with this explanation Taniguchi (2007) finds a negative correlation between college enrollment and having young children. It is further known that lower class women have a higher risk of teenage pregnancies than the female population has on average (Siebert, 1972; Stinchcombe, 1968; Stulberg and Chen, 2011). These circumstances could counteract young working-class women's motivation to achieve higher education. Giving birth to a child or marrying before turning 23 (a typical age for on-time college completion) should hinder working-class women to enroll into college right after completing high school. As a consequence, the share of young women who are motivated for higher education, but could not realize this earlier, should be higher among young working-class women than in any other group Then, the switching of class-coefficients among women has to disappear if early marriages and pregnancies are kept constant (Hypothesis 1b).

Another possible deterrent for highly aspiring young adults from immediate enrollment after high school are parents' difficulties to finance higher education. Generally, this would affect men as well as women, except that boys are served with priority (cf. Jacob, 2011). This explanation is unlikely, given that the participation rates of women in higher education grew faster than those of men. Even if lower-origin men on average have lower aspirations and are kept out of higher education at the same rate, they must also catch up in educational attainment over the life course, just to a lower rate than working-class women catch up to upper-class women. This is not the case in the models in table 4.4.4 in chapter 4.4. Furthermore, even though wealth is not controlled in its full scope in the models in table 4.4.4, the results take the poverty status of the family already into account and the pattern persists. Therefore, the number of siblings and the number of brothers are unlikely explanations. As influence on the class inequality of women and men cannot be precluded, I keep the presence of older and male siblings constant in the models estimated to test for other mechanisms.

4.5.3 Historic Changes

The second group of mechanisms, comprising explanations based on changing macro conditions over time, contains again several possible explanations. First, the historical trend towards more gender equality in educational achievement (Buchmann, DiPrete and McDaniel, 2008) could have encouraged mostly those to re-enroll who were most disadvantaged before. For example, a change in returns to education for women could have changed their motivation to participate in education. Second, I simplified the research question by putting all types of colleges into one broad category. However, different institutions target different populations. Community colleges, in general, are there to serve disadvantaged students, even in later life (Lucas, 2006, 227). This type of college enables students to follow more flexible educational careers, which also implies slightly more re-enrollments. Possibly the growth of this type of colleges helped the previously disadvantaged women. Since the NLSY79 is a cohort panel and the entire cohort moves through the same historically changing conditions together, I do not have the chance to compare it to other cohorts under different historical conditions. Only such a comparison would allow testing these mechanisms. Therefore, I do not elaborate explicit hypotheses for the historic change explanations. However, if all other explanations fail, one can assume that the true explanation is more likely to fall into this group of mechanisms.

4.5.4 Life Events

Third, gender specific life events could directly increase the chances of re-enrollment – instead of preventing an early 'non-enrollment' as argued above. Again, partnership formation and marriage can be important aspects, however in a different manner. In the group of mechanisms mentioned above we also expected events to be effective, but rather in keeping young and motivated women away from higher education in the time after high school. Besides this indirect effect on the composition of the population at risk, the same life events could immediately and directly trigger participation in postsecondary education. For example, previous research showed that divorce increases the subsequent rate of re-enrollments (Bradburn, Moen and Dempster-McClain, 1995; Taniguchi and Kaufman, 2007). Married women, and possibly working-class women to a higher degree, often occupy traditional family roles as homemakers in male breadwinner families. Divorce changes the expectations

in their role and possibly opens the opportunity for women to re-enter into education. Not to mention that divorced women can chose their place of residence often much more independently. Beyond opportunity structures, these women might also see a stronger need to make their own living in the future and therefore see higher education as a means to improve their job search. I expect to replicate and confirm the findings from previous studies that women who were divorced or not married are more likely to re-enroll into college than married women (Hypothesis 2a). Beyond, I propose that this, coupled with a higher divorce rate among working class daughters, can explain the higher late enrollment rates of working class women. Assuming that these women act upon divorces with re-enrollments, I expect that keeping divorce events over time constant explains the changing coefficients and cancels out the late advantage of working-class women (Hypothesis 2b).

By contrast to the higher re-enrollment rate of single and divorced women, one could argue from the perspective of costs as a deterrent (cf. chapter 4.3) and hypothesize that married working-class women re-enter more often due to the financial aid of their husband. If partners play a role in financing higher education, this would affect working-class women more since they lack parental support. Then, married women would re-enroll more often and the controlling for marriage in a time varying way would explain the pattern of switching coefficients over the life course (Hypothesis 2c). For both hypothesis 2b and 2c, the presence of children can be related to the central explanatory variables as well as to the outcome. Therefore, for testing these hypotheses the presence of children is to be kept constant as a time varying variable.

Other life course events may indirectly account for re-enrollment. To prevent families from falling into poverty, e.g. after a job loss, the U.S.-department of Health and Human services organizes the 'Temporary Assistance for Needy Families (TANF)'-program[34]. The TANF program replaced earlier programs which were more important for the NLSY79 cohort, and also cut the possibilities for enrollment during recipiency (London, 2005). A similar focus on the presence of young children had the AFDC (Aid to Families with Dependent Children). Under these welfare programs, families with young children are eligible to a number of different services which are to a large degree state-specific. The federal government provides basic funding and a

[34] For an overview on the TANF program and its successors see www.hhs.gov/recovery/programs/tanf/tanf-overview (Feb 11, 2013).

legal framework. Under the TANF-framework, shorter and vocational oriented educational programs might be counted as 'work activities' and thus initiate re-enrollments (even though only for short term education). Previous studies could show that welfare benefits can indeed increase investment in human capital and that cuts in welfare and harder sanctions reduced, alongside with a higher employment rate, also enrollment rates (Dhaval et al., 2011). At the same time, there existed voluntary programs by several states which support adult education and were targeted specifically at AFDC-recipients (Greenberg, Michalopulos and Robins, 2003). Since lower class families are more likely to receive aid and at the same time women are more likely to care for children, the program could lead to an overrepresentation of working-class women among late enrollers. If this explanation holds good, controlling for recipiency would then explain the advantage of working-class daughters for enrolling after the early twenties (Hypothesis 2d).

4.5.5 Empirical Analyses: Women's Changing Inequality over the Life Course

The following empirical analyses are based on the female part of the sample used in chapter 4.4. The models are specified in the same way: with a reduced set of controls compared to the previous chapter 4.2 and social origin being operationalized using a simplified version of the EGP class scheme (Erikson, Goldthorpe and Portocarero, 1979; Goldthorpe, 2000). Following then, I extend the Cox-proportional hazards regression models (Cox, 1972) from table 4.4.4 in chapter 4.4. Biographical events can be modeled as time varying covariates increasing or decreasing the re-enrollment rate to college when they occur.

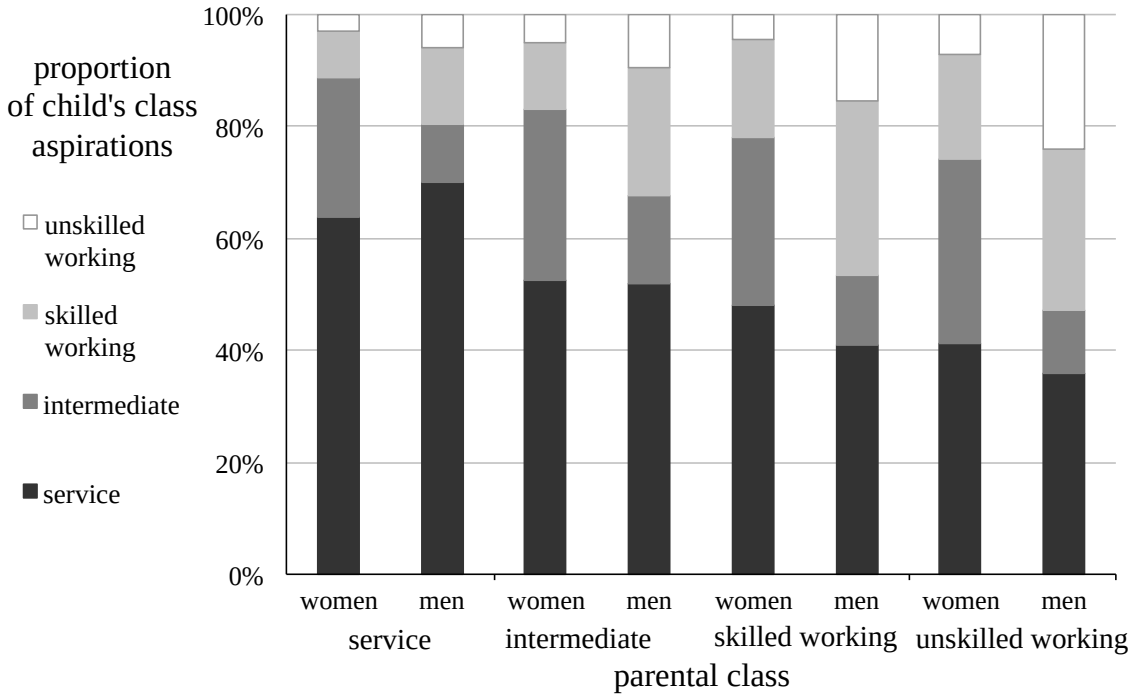
4.5.6 Results

In order to test the prerequisite of hypothesis 1a that both women and upper class children have generally higher class aspirations compared to men and lower class children respectively, I plot the occupational aspirations according to class of origin and sex.

From the literature we know that abstract aspirations more than concrete expectations of educational achievement are underdeveloped among lower classes compared to upper classes (Trusty and Niles, 2004). The test employed here is thus a rather conservative approach. The NLSY79 cohort data contains a good measure for

abstract class aspirations, which should be rather free from being biased by concrete plans to enter college. All participants were asked about their most desired occupation in the future. I coded these occupational codes into the same class scheme as the parental class variables. In figure 4.5.1, I show that there are clear sex differences with respect to aspiring a skilled working or unskilled working class job: these jobs are more often desired by young men, in particular by those from (skilled or unskilled) working-class origins. The aspirations towards a service class or intermediate class job are much less sex-specific among children from higher social origins: most of them aim at jobs in the upper classes, as shown by the left group of bars. Comparing the highest to the lowest class of origin, the origin-differences are only half the size for women compared to that of men. These results support hypothesis 1a that women's occupational aspirations are higher and that the distribution is more equal for women than for men when looking at the different parental classes. Thus, if women's higher aspirations do not mirror in higher immediate enrolment rates, this pattern could potentially explain, as hypothesis 1a has suggested, the switching class coefficients among women.

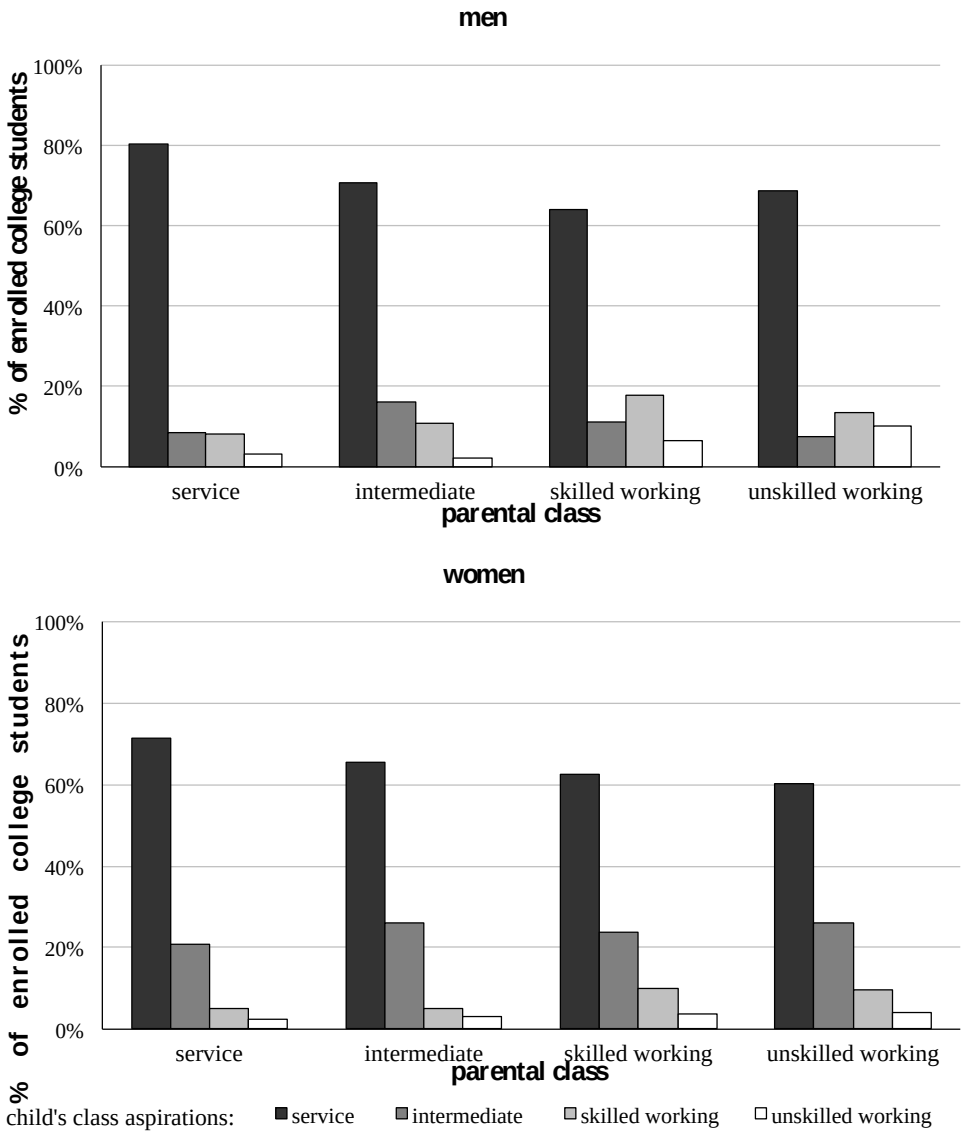
Figure 4.5.1: Class aspirations before or at graduation from high school by parental class and sex.



Data source: NLSY79, own calculations.

The next step is therefore examining the transition into college according to class aspirations for all of the combinations of parental class and sex. Figure 4.5.2 clearly shows a difference between male and female students. While a higher share of lower class women than men have the ambition to achieve a higher class position, men more often enter college directly. And indeed, as projected by hypothesis 1a, the immediate enrollment rate of women with service class aspiration is lower than the equivalent value for men. This finding implies a larger high-aspiration share of women among highly-aspiring young adults. However, this percentage of 'wasted motivation' does not depend much more on parental class for women then for men.

Figure 4.5.2: College enrollment soon after high school, by parental class, child's own class aspiration and sex.



This finding fulfills a prerequisite for hypothesis 1b, which expects that women from the unskilled working class are deterred from entering college directly after graduation despite their high class aspiration. Since class aspirations and social origins are correlated as well, it is indeed plausible that more working-class women with high occupational aspirations are selected into the 'population of risk' for re-enrollment. In order to test the class aspiration hypothesis more systematically, I return to the models presented in chapter 4.4 (table 4.4.4) and introduce the class aspiration as an additional variable. Possible deterrents which ought to be especially strong for women are, as expected in hypothesis 1b, marriage and childbearing before

the typical age of college completion. In the next step, I will test this hypothesis and thereafter scrutinize the effects of individual life course events.

4.5.6.1 Does Early Family Formation Keep Women away From the Direct Track?

First, I introduce additional control variables which could account for the class-specific enrollment but are not discussed in the theoretical section above: the number of older siblings and whether the respondent was in a college preparatory track in high school. Since the number of missing values is higher for the class aspiration variable, I do not clean the sample from missing values on this variable for all models. Instead, I replicate the models from table 4.5.1 for each sample separately and then introduce the variable of interest. For the results shown, one should note that the switching coefficient pattern is even stronger in models where the class of the father is the reference instead of the maximal class out of both parents.

Model 2 in table 4.5.1 tests the implication of hypothesis 1a that the composition of potential re-enrollers consists of many highly motivated working-class daughters. The results do not show any significant effects for the class aspirations. Furthermore, the pattern of switching class coefficients remains unchanged. Hence the pattern of lower class women's college re-entry behavior cannot be explained by stronger class aspirations of women from the working classes in the population of potentially re-enrolling young adults.

Table 4.5.1: Model 1: Only compositional controls, model 2: controls for class aspiration included.

	model 1	**model 2**
time < 24 months	0.74	3.02
max. class		
service classes	*ref.*	*ref.*
intermediate, until 24th month	-0.04	-0.02
after 24 months	0.25	0.28
skilled working, until 24th month	-0.59*	-0.59*
after 24 months	0.69*	0.70*
unskilled working, until 24th month	-0.18	-0.16
after 24 months	0.24	0.26
inactive, until 24th month	-0.01	0.01
after 24 months	0.10	0.09
cohort		
born 1961	*ref.*	*ref.*
*1962, until 24th month	-0.22	-0.21
after 24 months	0.10	0.12
*1963, until 24th month	-0.57*	-0.58*
after 24 months	0.14	0.14
*1964, until 24th month	-0.58*	-0.56*
after 24 months	-0.12	-0.11
race		
white + other	*ref.*	*ref.*
black, until 24th month	0.25	0.24
after 24 months	0.36+	0.33
hispanic, until 24th month	-0.12	-0.12
after 24 months	0.90*	0.88*
afqt scores, until 24th month	0.01*	0.01*
after 24 months	0.01*	0.01*
poverty at age 18, until 24th month	-0.43	-0.41
after 24 months	0.22	0.23
college prep track, until 24th month	0.42*	0.41*
after 24 months	0.11	0.08
sibling in household, until 24th month	-0.12	-0.09
after 24 months	0.20	0.25
older sibling in hh, until 24th month	-0.23	-0.23
after 24 months	-0.09	-0.09
class aspiration		
service classes		*ref.*
intermediate, until 24th month		-0.15
after 24 months		-0.18
skilled working, until 24th month		-0.01
after 24 months		-0.33
unskilled working, until 24th month		-0.71
after 24 months		-0.46
N (persons)	1102	1102
events (enrollments)	383	383

+ $p < .10$, * $p < .05$
Data source: NLSY79.

Hypothesis 1b expects that the selection out of the direct pathway to higher education can be triggered by early family formation, measured in the following as experiencing childbirth or marriage before a woman turns 23 years old[35]. In order to test this hypothesis, I include these two time-constant variables into the next models shown in table 4.5.2. While early parenthood does not have any significant effects on belated college entry, married women are hindered from enrolling into college only in the first time period. Holding all other variables constant, in the second time period the positive marriage effect is not significant anymore. Most importantly, neither births nor marriages at young age can explain the class effects. The switching of class coefficients for women still persists. Consequently, to early marriages and parenthood applies the same as to the class aspirations discussed above. They cannot be made responsible for the diversion of motivated *working-class* women from college.

[35] The cut-point for age has undergone thorough sensitivity checks. We could alter it to a younger age and would still arrive at the same conclusion. However, choosing 'younger than 23' as the criterion can also be justified theoretically, since before this age it is hardly possible to complete higher education.

Table 4.5.2: Proportional hazard models with time constant covariates – Effect of early parenthood and early marriage, log hazard ratios.

	model 3	**model 4**
time < 24 months	1.00	1.95
max. class		
service classes	*ref.*	*ref.*
intermediate, until 24th month	-0.18	-0.04
after 24 months	0.21	0.23
skilled working, until 24th month	-0.74*	-0.54*
after 24 months	0.65*	0.67*
unskilled working, until 24th month	-0.34	-0.18
after 24 months	0.30	0.35
inactive, until 24th month	-0.03	0.15
after 24 months	0.08	0.07
Control variables: sex, birth cohort, race, poverty at age 18, afqt score, college prep track in HS, if older siblings in household and early births and marriages. Coefficients reported in the appendix.		
birth before age 23		
birth before 23, until 24th month		-0.33
after 24 months		0.08
marriage before age 23		
marriage before 23, until 24th month		-0.55*
after 24 months		0.23+
N (persons)	1181	1181
events (enrollments)	398	398

+ $p < .10$, * $p < .05$
Data source: NLSY79.

4.5.6.2 Changes in Family Status and Welfare Recipiency: Do They Bring Working Class Women Back to School?

Another group of mechanisms consists of biographical events which could occur above the ordinary rate among young women from the skilled or unskilled working class. To test the proposed hypothesis, I now include the time varying covariates 'marital status' and 'having young or old children' into the model (hypothesis 2a to 2c) – instead of the event occurrence at young age as in table 4.5.2. Note that I do not

report the baseline models without these variables again, as the number of cases is now identical with the models reported in table 4.5.1.

The results replicate the analysis of Taniguchi and Kaufman (2007). Just like them I find significant effects of divorces on re-entry into college. Women with children of the age between 0 and 5 are less likely to re-enter college than women without children, but also than women with children older than 5 years. The negative effects of having young children are found for the first as well as for the second time-period, whereas the second-period effect is smaller than the first-period effect. For older children, only the coefficient in the second period is relevant and shows that women with older children are even more likely to re-enroll in college than women without children. It is the first of the competing hypothesis about the influence of family formation that can be approved. The positive and significant effects of divorced and not married women that, in accordance with hypothesis 2a, re-enrollment is more common within these groups than among married women.

The central of this analysis, however, was not to analyze the effects of women's life-events on enrolling into college. Though, there is no support for the claim that this circumstance could be explained in the way hypotheses 2a to 2c suggest. While having young children and being married could be identified as deterrents to belated college enrollment, their occurrence does not explain the changing effect of social origin over time.

Hypothesis 2d then suggested that recipients of welfare benefits which target at poor families with young children could be the explanation for the social origin differences among women. Model 5 in table 4.5.3 includes, instead of the changing state of the family biography, the recipiency of TANF or AFDC over time. The variable is coded 0 if no welfare benefits were received (the majority of all monthly observations), and 1 if the respondent received benefits from the respective program at that time. In line with previous research, the AFDC program can increase the probability of an investment in human capital. A positive effect is found for the late enrollments in the second period of time. Not so for early enrollments. This is reasonable given the rather small number of families with such young parents. In the same way as for the family biography, the social origin effects remain unaffected. The coefficients, especially the once for the skilled working classes, still switch from negative to positive for all classes and are still statistically significant for the parental skilled working class. Thus, hypothesis 2d is not supported either.

Table 4.5.3: Proportional hazard models with time-varying coefficients – Effect of marital status, children and welfare programs, log hazard ratios.

	model 5 welfare programs	**model 6 family formation**
time < 24 months	3.03	-27.49
maximal class		
service classes	ref.	ref.
intermediate, until 24th month	-0.04	-0.04
after 24 months	0.20	0.25
skilled working, until 24th month	-0.54*	-0.51+
after 24 months	0.66*	0.66*
unskilled working, until 24th month	-0.19	-0.12
after 24 months	0.35(+)	0.35+
inactive, until 24th month	0.14	0.19
after 24 months	0.05	0.03
Control variables: sex, birth cohort, race, poverty at age 18, afqt score, college prep track in HS, if older siblings in household and early births and marriages. Coefficients reported in the appendix.		
children		
no. of children younger th 6, until 24th month		-0.64*
after 24 months		-0.25*
no. of children >=6 <35, until 24th month		-0.40+
after 24 months		0.09
marital status		
married	ref.	ref.
never married, until 24th month		0.63*
after 24 months		0.78*
divorced, sep. or widowed, until 24th month		1.03*
after 24 months		0.39*
program recipiency		
AFDC, until 24th month	0.50	
after 24 months	1.20*	
TANF after 24 months	0.15	
N (persons)	1181	1181
events (enrollments)	398	398

+ $p < .10$, * $p < .05$
Data source: NLSY79.

4.5.7 Discussion and Conclusion

Subject of this chapter was to explain the fact found in the previous chapter that American women from the working classes catch up with service-class women somewhat by attending late college education more often. I have discussed and empirically tested a number of explanations for this pattern of 'switching class coefficients over the life course'. The explanations that I have discussed fall into three blocks: first, the presence of deterrents of working-class women from direct college enrollment which lose their force over time while the motivation for education persists. Then, we could expect working-class women to make up leeway for their educational and occupational expectations they had. Second, historic changes over time in favor of women's employment could encourage the motivated and able working-class women to acquire additional education. And third, class specific life events related to women's family biography which could trigger enrollment. Examples are the marital status and, as an indirect consequence of childbearing, the recipiency of TANF or AFDC.

Summarizing the results is straightforward: the tested hypotheses for all of the different explanations are not supported by empirical evidence. Even though their plausibility has been strengthened since I could could identify that there are more working-class women who are deterred from higher education than service-class women in spite of their aspiration for achieving a service class occupation. The strength of the respective coefficients would have been even larger if the fathers' instead of the dominant family class would have been used to identify social origins. The mechanism I was not able to scrutinize is a historic change of labor market conditions in favor of women. One may or may not see the non-confirmation of alternative explanations as a support for this interpretation. On the one hand, a number of tests did not lead to support for any of the other explanations. On the other hand, several flaws could have caused these 'non-findings' as well. The measured aspirations for example could change over time and could be non-persistent. Measurement errors for the family events are unlikely, but could occur as well with regard to the aspirations or program recipiency. Therefore, the chapter cannot offer a final conclusion.

Another alternative to the three discussed blocks of explanations is that (community) colleges indeed target specifically at women who are disadvantaged in

the labor market. The comparative findings of other coefficients going along with problematic labor market outlooks, such as early pregnancy, could be interpreted in this line. This would be an encouraging result for all those policy makers who suggest reducing inequality by offering lifelong educational opportunities. However, this policy implication should be carefully evaluated using more fine-graded studies. Furthermore, I have argued in section 3, overcoming inequality in earlier stages of the life course would make such second chances obsolete.

Even though the analyses presented here leave the puzzle I set out to explain open for future research. It opens perspective for the design of such studies. Ideally, the historically changing labor market entry of women and the role of education as a part of it should be studied by comparing inequality in enrollment over the life course between different cohorts.

5 DIFFERENTIATION IN HIGHER EDUCATIONAL CAREER PATTERNS AND LABOR MARKET SUCCESS: SUSTAINABLE DISADVANTAGES OR GAINS FROM DETOURS?

This last empirical section goes beyond the question of inequality in education and investigates how different educational careers might affect returns to education upon labor market entry. The relevance of this additional analysis is twofold. First, it allows to get a better idea how delay, interruptions or detours in educational careers are contribute to the intergenerational persistence of social positions. And second, the question of educational career patterns allows in several instances to empirically distinguish between contradicting explanations for returns to education in the labor market. I will give a short overview over the theoretical approaches to these questions and then present two empirical studies, one on the US and one on Germany. There is neither a chapter devoted to the Swedish context, nor a comparative chapter. The Swedish sample is too small for such an investigation, and there are already rather clear results for the Swedish context. For the US on the other hand, previous research is inconsistent. For Germany, I focus on a specific type of interruptions, the completion of a double qualification, which is quantitatively important. Further, I do not make an extensive comparison of contexts and do not formulate hypotheses on the macro-level. For the moment, the various interruptions and detours which are typical for the different countries seem too different to compare labor market institutions. Furthermore, results are similarly small for both contexts, which makes it appear that the processes are not moderated as much as other aspects of the school to work transition by the country context.

5.1 More than Schooling: Transitions to the Labor Market from Delayed or Interrupted Educational

This chapter prepares the following chapters 5.2 and 5.3 by discussing theoretical explanations for returns to education. I will first illustrate the structure of the life courses and the possible empirical questions, which all imply different theoretical questions. Then I discuss different theoretical answers on the question why education pays off in the labor market. I develop hypotheses how the various and sometimes contradictory mechanisms can be differentiated empirically by comparing the pay-offs of interrupted and non-interrupted educational careers.

Throughout all previous sections, the focus of this volume was on the question of the educational career. This last section will go one step further in the sequence of status attainment in the life course and ask for effects of educational careers on the labor market entry. It directly complements the discussion in the previous section in several ways.

Delays and stop-outs occur frequently and many students acquire education after a later re-entry into college. Furthermore, summarizing the findings of the previous chapters, later re-entries – such as earlier educational transitions – continue to be socially selective. They occur more often among children from the service classes. On the other hand, those young adults from lower class families who participate in higher education are more likely to do so with interruptions (chapter 3.4). This pattern is in contrast to the hope of policy makers that second-chance educational opportunities will promote educational inequality (cf. introduction to section 3). In sum, the previous chapters show that in the open education systems with a strong differentiation of educational careers, Sweden and the US, inequality in late education is higher than in Germany. The question on intergenerational inequality, however, involves more than only educational attainment. Success in the educational program entered is important as well. And beyond, the total contribution to intergenerational inequality needs additional analysis on the labor market returns of specific educational pathways.

In the literature on intergenerational inequality, this is often referred to as the OED-triangle (Blau and Duncan, 1967): social origin influences both education (OE) and the social destination (OD). And in addition, education affects the destination as well (ED) and thus explains a part of the intergenerational transmission of status or class. Thus, to learn about the indirect effect of social origin on the destination – the present standing in a society via education – the link between education and destination needs to be studied as well. In the past, research showed that education plays a major role for the intergenerational transmission of inequality (Ishida, Müller and Ridge, 1995), in particular the hierarchical element of the class scheme (Breen and Luijkx, 2004). The link to unequal positions in the society seems to be all too obvious. With increasing educational expansion, a differentiation of education in a multitude of aspects has taken place and many new aspects of educational achievement are now connected with social origins beyond the level of education achieved (e.g. Ayalon and Shavit, 2004; Lucas, 2001; Lucas, 2009; Roksa, 2011; Roksa et al., 2007). The analysis of educational careers in the previous chapters shows this diversification along on the timing dimension. Only few studies, however, have made this further step towards assessing the consequences of educational differentiation for social inequality. Though, this 'ED'-link is a crucial component to link findings on emerging inequalities by differentiation of previously more homogenous educational programs back to the inequality debate. Educational inequality has not only been present in attainment in youth, but also in the rates of enrollment throughout young adulthood and in the patterns of educational careers (as shown throughout sections 3 and 4 of this volume). And even is late flexibility for late entry is successful in equalizing education, as chapter 3.4 has illustrated, its impact is likely to be small and lead to a later entry of lower class children into postsecondary education. This circumstance leads to the follow up question how late entry affects labor market success and the standing in the society. How much can be gained individually by late entry into postsecondary education? Does the higher rate of re-entrants benefit the higher classes? And what are the consequences for being late? Does the same education achieved earlier in life and without interruptions pay more than the one achieved via the long and winding road? These questions are broad and general. The following discussion will formulate theoretical expectations and the chapters thereafter attempt to answer a part of them empirically.

While the other sections of this book have engaged much into comparative work, this one will conduct analyses on single countries and only give some comparative insights in the discussion at the end. There are several reasons for limiting the analyses to single country studies. First, as the literature review will show, previous findings are inconsistent. Thus, it seems that working out a sound basis of empirical research on the micro level is a prerequisite for developing a reasonable theoretical framework for comparative research. Second, labor market institutions are one, but probably not the most important differences between countries. The educational system differs not only in its institutionalized connection to the labor market, but also in the characteristics of the interruptions themselves. I argue that it needs more research before a comparison can be reasonably made between the effects of German students completing vocational training before entering higher education and e.g. American students stopping out for one semester. At the end of the section, a concluding part will summarize the results and compare them between countries, also discussing other results from the literature.

5.1.1 Returns to Education: Do they Depend on the Timing and the Trajectories of Postsecondary Educational Careers?

The question how gaps and detours are related to returns to education has, not surprisingly, got the greatest attention in those countries where higher education careers were comparatively de-institutionalized and individualized. The existing research is, however, still a broad and unsystematic field. The various studies are mostly contributions to single aspects of the gains or penalties of certain groups compared to certain others. The empirical questions are manifold and each one implies a different empirical design. To exemplify, if individuals can boost their income by additional schooling this does not mean that they will eventually get as much as those who achieved the same schooling level as soon as possible. Most of the studies miss to put all possible effects of delays and detours into the context of the life course[36]. Since a delayed entry into- or an interruption of higher education can affect life chances in multiple ways, this seems a necessary contextualization for the interpretation of the single studies. Beyond the large variety of empirical questions and their different implications, the theoretical explanations are manifold as well and

[36] For an exception see Humlum (2007).

many have not yet been tested empirically against each other. The large number of mid-range theories for explaining why education pays off, such as the human capital or signaling approaches, are difficult to turn into contradictory hypotheses in a convincing way (Bills, 2003). As a rough classification, the theoretical mechanisms at work divide into two blocks. The first block consists of the effects of delays and stop-outs on the educational career itself. The second block consists of mechanisms which are directly related to the labor market entry and would occur even if educational achievement was not affected by the non-standard career pathway.

The first block is likely to be important in many different ways. Entering education with labor market experience in the respective field could affect both students' performance and persistence through several mechanisms. One reason for a bonus of late entrants can be derived from on information-economics. As a side effect of work experience young adults can 'discover their learning potential' and get useful information, e.g. to improve their choice of a study program or study more efficiently and motivated within higher education. This argument is similar to the idea of Oettinger (1993; 1999), that students are more aware of the returns they can get for a certain type of studies after entering the labor market.

As e.g. Oettinger has argued, young adults might discover their potential during their first time in the labor market and collect relevant work experience to improve their choice of the study program and learning (Oettinger, 1993; Oettinger, 1999). However, empirical research points towards the opposite. In a study of Oregon high school leavers Kempner and Kinnick (1990) have shown that delayers have a lower chance of degree completion. Evidence from more recent studies confirms this finding using nationally representative data for the US. The completion rates of delayers are found to be extremely low, even in study which paying much attention to modeling unobserved heterogeneity (Bozick and DeLuca, 2005; Roksa and Velez, 2012; Taniguchi and Kaufman, 2005). Stop-outs and delays often go along with repeated gaps in the subsequent educational career (DesJardins, Ahlburg and McCall, 2006). Jacobs and Berkowitz-King (2002) also found lower completion rates, but only when not adjusting for conflicts in time allocation via the incorporation of family and employment status and the part-time college status.

For Germany, Müller and Schneider as well as Meulemann found that those young adults who qualify for higher education through a non-standard pathway in the secondary education system as well as those with vocational training before enrolling

have higher drop-out rates (Meulemann, 1988; Meulemann, 1989; Müller and Schneider, 2012).

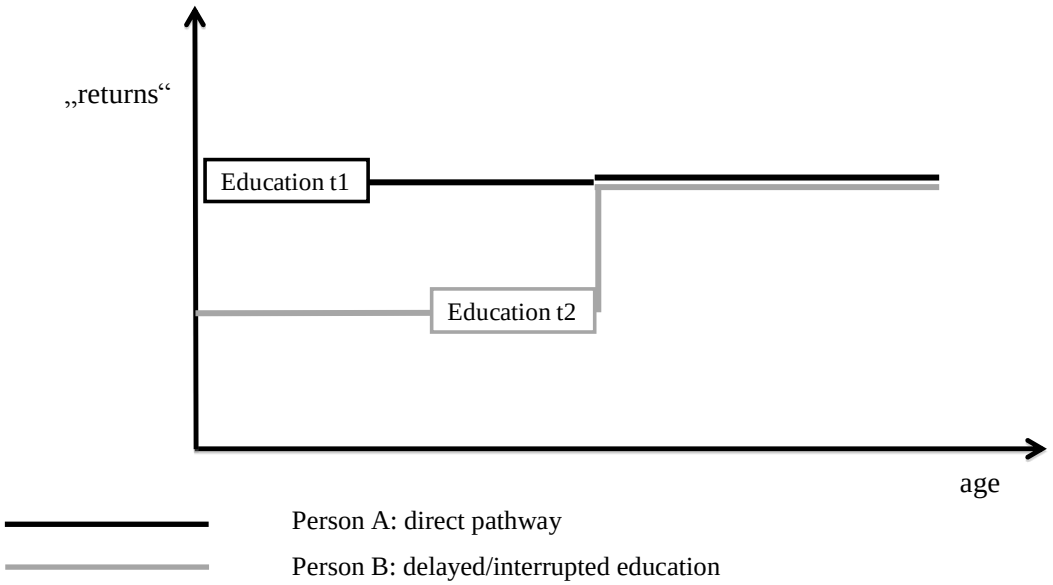
That returns to education are probably impaired through this pathway should be considered when interpreting the results for later labor market returns: even if the detours pay off, they can come at the cost of lower success in the higher education system. Given that degree completion rates have declined over time in the US (Bound, Lovenheim and Turner, 2010), the lower chances of completion among delayers are already an important aspect of delayed education. The existing empirical evidence shows a consistent pattern: non-traditional students are unlikely to complete their degree in the US, and also in Germany graduation is less likely of late entrants.

On the second pathway affecting intergenerational status transmission, effects on the labor market entry, a more thorough literature review will follow below. Here, the evidence is much less coherent as for the effects on the educational career.

5.1.2 Timing and Success at the Entry into the Labor Market

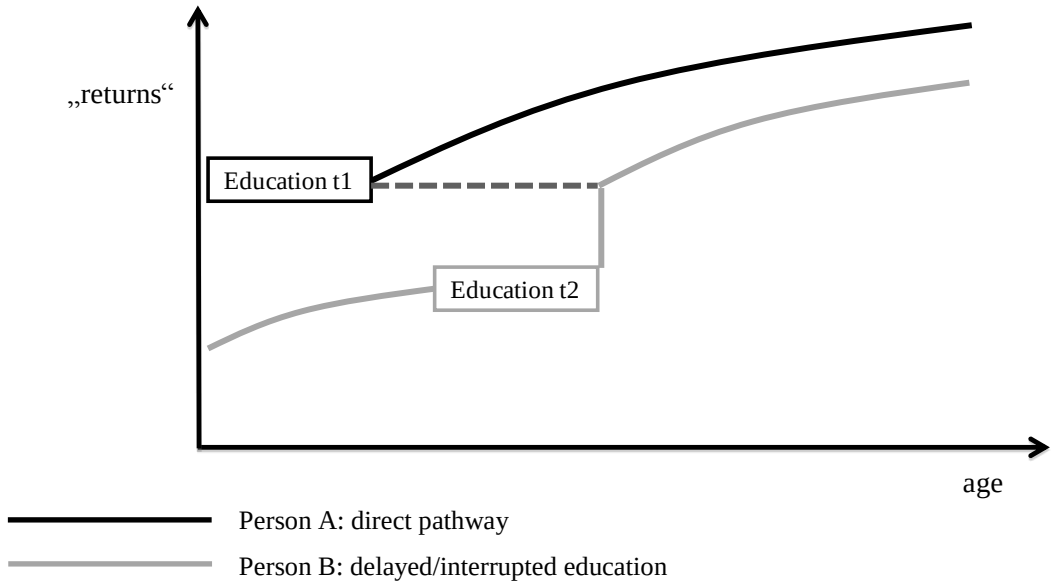
A multitude of mechanisms can be drawn from the literature on how returns to education are affected by work experience (Weiss, Klein and Grauenhorst, 2013). Most obviously, opportunity costs for delaying educational achievement will affect the lifetime income. The later any returns to education can be realized, the less time is until retirement. This simple and obvious disadvantage of delaying education – which is depicted in figure 5.1.1 – is rarely discussed in empirical research papers since it appears to be trivial. However, it will always be present as an inevitable disadvantage of the delayers and should thus not be forgotten in the debate about the pro´s and con´s of detours through the educational system (Humlum, 2007).

Figure 5.1.1: Opportunity costs of delaying higher education.



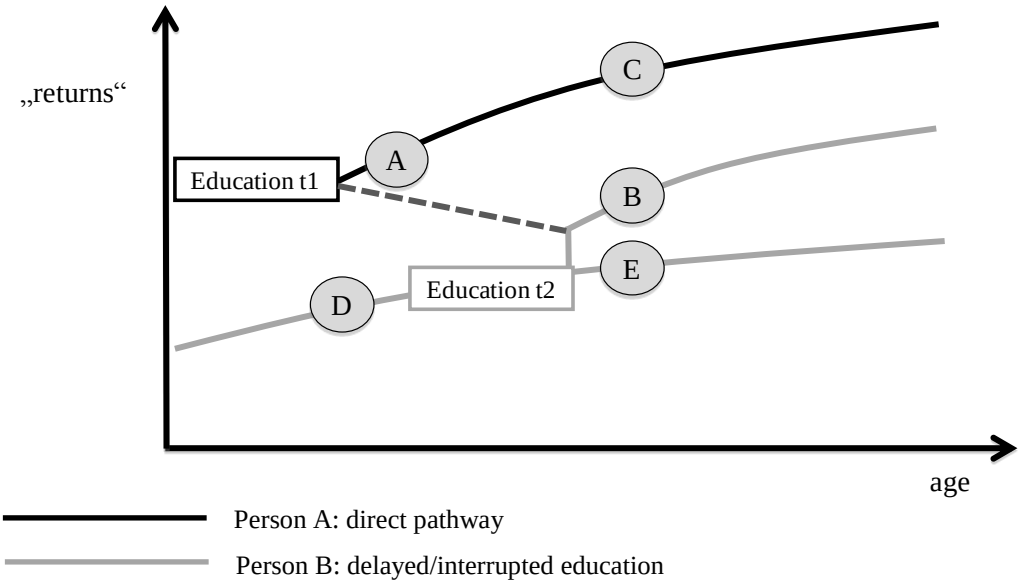
The direct opportunity costs as depicted in 5.1.1 are probably just one aspect of ‘forgone’ returns for giving up an early start of the career. Another component of the total disadvantage of delayers will be added if career trajectories according to tenure exist. Such trajectories imply that after entry into the labor market, a typical career is followed, with increasing wages and upward status mobility over time in the labor market. These long term wage developments can be expected to be more pronounced in service class positions (Goldthorpe, 2000) – which are the class positions that are typically entered through higher education (see Goldthorpe and McKnight, 2006 for empirical evidence supporting this claim). For jobs within these class positions, employers and employees typically establish long term relationships with rewards according to job tenure. If such career trajectories apply, late entrants will pay for their late start with a ‘career-lag’. The later they start their career, the later they can realize career advancement. If career trajectories are on average the same as for the early entrants, late labor market entrants will lag behind throughout the entire career until retirement, as depicted in figure 5.1.2.

Figure 5.1.2: Opportunity costs of delaying higher education and permanent lagging behind.



Both components illustrated in figures 5.1.1 and 5.1.2 are yet nothing but forgone returns due to later entry – and thus rather trivial to explain theoretically. A possible third component is less straightforward. The compensation which can be achieved for work in the labor market or its increase over the career could also directly depend on previous educational career patterns. A theoretical explanation for such an effect would though need some more elaboration – and has multiple facets. There could be a penalty, as depicted in figure 5.1.3, but other theoretical approaches would rather expect a bonus for interrupters and delayers (which does not necessarily outweigh the opportunity cost effects, though).

Figure 5.1.3: Illustration of comparison groups to investigate potential costs and bonuses for delaying education.



5.1.3 Employer Behavior and Applicants Respondents: The Role of Previous Employment during the Job Matching Process

Much of labor market success is determined by the demand of employers. Employer behavior is thus a critical factor in the determination of a penalty or a bonus for educational career patterns such as delays or drop-outs. A bonus for those who are off the norm by having gained work experience before leaving school can be expected mostly from the perspective of the human capital argument. This approach highlights the productive skills being acquired in the educational system and via ‘on-the–job’ training. These skills are – to human capital theorists – the core reason why education and experience pay off in the labor market (Becker, 1964; Mincer, 1974). Against this background, two outcomes are possible. Either interruptions are related to an increase in productive skills, then additional human capital would be collected and a bonus in the returns must be expected. Or it does not increase the stock of human capital – and the effect on the returns would be zero. For the human capital theory it needs additional assumptions to construct an argument why delayed and interrupted education should yield lower returns. In the classical model, the number of years of

schooling determines the returns, not their allocation in the life course[37]. Several scenarios are possible that might explain the impact of educational career patterns on returns in the labor market:

- If assuming that previous work experience is brought to college when re-entering, the learning process could be improved and later gains would be higher than if college is just completed without prior practical knowledge about an occupation or an industry.
- On the other hand, the earlier and more straightforward education is acquired, the more time can be spent in the labor force after education. This experience should be more valuable than experience before re-entering college, because it is on a higher qualification level. Finally, interrupted and uneven educational careers have a higher probability of being inconsistent in the field of study. Field-specific human capital should have lower worth if with other fields in an educational career. To exemplify, two years of law and two years of medicine are likely to yield lower pay offs than four years of either of them (this is not necessarily the case, in fact, again the opposite could be true in some instances).

In sum, the prediction based on the human capital perspective depends on additional assumptions. But lower returns are compatible with some extensions of this perspective. Further, the type of interruption comes into play. Interruptions grating human capital or at least information about work can be expected to have less negative effects on returns than those interruptions which do improve productivity.

Among the mechanisms discussed so far, the human capital approach was the only one with an explicit statement about the behavior of employers. A plus in income is expected, because the employer values the higher productivity of the more experienced employees. However, at the moment when employers meet the employee the first time and decide about the hire, interruptions in the educational career can signal more than productivity. From the theoretical point of view of the signaling- and screening-argument, employers search for signals of desirable traits of their employees (Arrow, 1973; Spence, 1973). And potential employees try to gain useful signals to ‘prove’ their productivity and potential of trainability. Against this

[37] Although Mincer highlights returns to experience, implying that work before or during studies should have rather positive returns (Mincer, 1974).

background, detours can also be related to lower returns compared to the same education achieved on the 'royal road'. Having a long and winding 'career road' with many entries and exits from education could be seen by employers as an indicator of low performance, e.g. poor educational performance or a lack in motivation and steadfastness. The role of personal characteristics, instead of the growth in cognitive competences, has been highlighted by the socialization hypothesis of education (Bowles and Gintis, 1976). In contrast to the human capital theory, the increase in productivity of more educated individuals originates from socialization to work environment – and not (only) by an improvement of skills and competencies. This socialization is projected to go along with the development of personality traits being demanded by employers in capitalist economies (Bowles and Gintis, 2000), such as 'patience' or being 'used to following rules'. Combined with the signaling hypothesis, the way how the educational career is pursued can be used as a signal for the 'educative process', i.e. in how far the individual was able to integrate into the system and turn its own potential into success at given rules. Featherman and Carter have argued along these lines in their seminal study on the career effects of interrupted education:

> 'Perhaps, tenure per se is not as important as continuity in schooling; perhaps those who go through without interruption (and without retardation) are those with personalities most highly valued by employers. For example, they may be more punctual, better planners, more efficient, more persistent, more compliant, and less distracted; these traits may well be related to efficient progress through school and to lower "training costs" on the job, but maybe they are not.' (Featherman & Carter, 1976: 157).

Such processes of sorting out of those deviating from the norm have been observed for other characteristics. The probably most striking case against the pure reading of the human capital idea are overeducated individuals, that fall off the norm and will thus often not be hired, even though in possession of more human capital (Bills, 1992).

Testing the mechanisms – or as Bills has termed it in accordance with Merton – middle range theories on the worth of education in the labor market against each other is a difficult endeavor. For most empirical questions they hardly lead to contradictory hypotheses. A large literature attempted to separate the effects of productivity and signaling, e.g. in the economics discipline under the headline of the sheepskin effect (Belman and Heywood, 1991; Groot and Oosterbeek, 1994;

Hungerford and Solon, 1987; Jaeger and Page, 1996; Silles, 2007; Weiss, 1995). Bills (2003) concludes that previous research has not been convincing in testing the signaling perspective. Arriving at contradictory hypotheses which are straightforward tests for any of the two opposing claims has sometimes been successful when education is treated more differentiated than merely looking at final achievement. Two situations can be helpful for performing such tests. Once degrees are constant employers have to either find further signals that vary independently from the amount of schooling, or find variation in schooling which is not associated with additional signals. To give an example, the study of Groot and Osterbeek (1994) used this circumstance and found for the Dutch context that delayers and repeaters in education can indeed receive a bonus rather than a penalty. The strength of the study of Groot and Osterbeek is that educational credentials are kept constant. At the same time the amount and the way (in terms of educational career patterns) of schooling varies. The signaling value from delay or repetition should then, in any case, lead to a penalty. But the authors find a bonus, and interpret it as support for the added value of additional schooling at constant credentials – a finding in favor of the human capital theory. While the findings persist after keeping test scores of cognitive performance statistically constant, anything that could be triggered in schools after the detour is included as control variable in the model. Thus, while the negative signal could be present, repeating school could for example have altered the child's development and personality through the change of the relative position within the classroom.

The link between occupation and productivity is assumed to be even weaker for 'credentialist' hiring. According to this mechanism, access to occupational positions has to overcome 'closure' (Weeden, 2002). Credentials – i.e. educational certificates – take the role of entry tickets into closed and to a certain degree privileged occupational positions. The way how employers let themselves be guided by standardized preconditions is that they 'operate on widely shared societal assumptions about the appropriate relationship between schooling and job assignment' (Bills, 2003, p. 452). In many contexts, these common assumptions are mirrored in legal regulations (e.g. Bol and Van de Werfhorst, 2011). Credentialist hiring has the effect that employers limit their criteria to educational degrees, other – direct or indirect – signals of productivity are disregarded (Bills and Brown, 2011). Educational career patterns should thus be totally irrelevant for the returns to education. However, there are potential degrees of freedom for other mechanisms to

operate since the credentialism hypothesis remains silent on the question how employers differentiate between applicants with the same degree and how incomplete education is rewarded. If there are aspects counting for returns that are beyond the mere credentials – such as interruptions or delays of educational careers – credentialism would at least have to be complemented by other mechanisms. In a strict reading of the theory, neither delays nor interruptions should be related to bonuses or penalties in the labor market, unless they are linked with additional educational credentials.

Obviously, detours in educational careers offer several opportunity to empirically differentiate mechanisms of the link between productivity gains and the mere signaling value of education. In the following two chapters on Germany and the US, such tests will be attempted. The hypothesis resulting from the signaling approach is that interrupted and delayed higher education pays less in the labor market, because another signal is there that can be used to indicate negative performance as Featherman and Carter have described. But when would employers rely on such a weak and blurry signal? One would expect that they do not rely on these weak signals if other, supposedly more reliable, signals are available. Therefore, I expect that such weak signals as interruptions are a negative signal only if other signals are unavailable which have a greater potential of indicating the 'true productivity' of an applicant.

5.1.4 A Life Course Perspective: Family Formation and Education

In the typical patterns of life courses in industrialized societies education and the labor market entry are concentrated in adolescence and young adulthood. Shifting them into later age can cause conflicts between life-domains and may complicate completion, but also the labor market entry.

As childbearing and family formation normally occur in certain age-periods, delaying college education will shift the educational career into a phase of the life course where it collides with other life events. This can lead to role conflicts or constraints in time budgets and geographical mobility. Between the age of 20 and 35, most of the initial family formation takes place. Hence, education which is completed later in the life course could pay less since the children's and spouses' situation limits flexibility for the job search. A successful labor market entry on the other hand plays

a key role for later labor market success (Scherer, 2004). Mothers with young children should be affected most, as their entry into the labor market would fall together with the labor market difficulties related to motherhood (Budig and England, 2001). Older students are known to work more and college work is strongly related to performance and drop out from college (for a review see Pascarella and Terenzini, 2005). Taken together, from a life course perspective we would expect that interrupted or delayed educational attainment leads to a forced choice between the societal-normative pattern of family formation and an optimal start of the early career. Hence, on average those individuals achieving education later would fare worse in their early returns on the labor market.

5.1.5 Empirical Research Questions

'Returns to late schooling' cannot only be a label which subsumes many theoretical research questions – as illustrated in the last section. Also the theoretical research questions are manifold. Table 5.1.1 summarizes and explains the empirical questions as illustrated in figure 5.1.3.

Among the different aspects, the probably most frequently asked question by researcher is whether individuals can indeed gain returns from re-enrolling. From this individual perspective, those who move straight to the degree are an irrelevant comparison group. More important is to ask whether the completion of an additional educational program will help to improve the labor market returns compared to the present situation. For this question, the relevant comparison consists of those individuals who decide against re-enrollment. The common strategy to identify the average added value to individual returns is the difference-in-difference design[38] relying on the comparison (B-D)-(E-D) in figure 5.1.3. Such studies have been published in particular for those countries where late entries occur rather frequently. 'Intra-career-returns' have been found to exist on income (Hällsten, 2011 - Sweden; Light, 1995 - US; Zhang and Palameta, 2006 - Canada) as well as on occupational prestige (Hong Li et al., 2000 - Switzerland) for different societies. The overall finding is, not too surprisingly, that individuals can improve their labor market situation by the acquisition of additional schooling. However, against the

[38] See the first chapters of the textbook authored by Singer and Willet (2003) for a n overview on the logic of this approach.

overwhelming evidence on the value of initial schooling (e.g. Klein, 2011), any other finding would have been a great surprise.

From an inequality perspective though, more empirical questions arise. Figure 5.1.3 illustrates them as well. Re-entrants seem to have returns to their investments in education. But are these the same as for those who manage to get ahead earlier? The mechanisms discussed above suggest having a closer look on this question as well, for at least two reasons. First because it is relevant for the evaluation of the role that delays or detours play for inequality. If higher education does pay off when it is obtained later, but to a lower extent than 'on-time' education, this would constitute a disadvantage of lower class children. This additional disadvantage in educational achievement remains unobserved when looking the highest educational degree or the years of education completed only. Second, because this situation of differentiation of the graduates with the same amount of human capital has theoretical implications. Given that human capital is kept constant, scrutinizing on the remaining difference can be enlightening with regard to the other theoretical mechanisms discussed above[39].

With the exception of the simple opportunity costs, all of the above mentioned mechanisms jointly contribute to the difference between interrupters and continuous students. This implies that all of them increase the gap between C and B in figure 5.1.3. Thus, the empirical question of the comparing C and B has only weak theoretical grip since many possible mechanisms are mixed. The late entry into the age-wage structure can be the reason for a penalty at this point as well as conflicts with family formation or mechanisms related to employer behavior. Such a comparison can, however, still be very useful because it can make a strong point to re-connect the findings to the general debate about intergenerational inequality. It summarizes the negative slope of the A-B line and the steady lagging behind in the career of the late entrants – and thus enables to answer the question whether delayers – who are more frequently from lower social backgrounds – are overall disadvantaged compared to their peers in the same cohort who got their education straight.

[39] Note that the distinction between the effects of interrupted careers on the one side and the gains through lifelong learning on the other side closely corresponds to the question what motivates the non-traditional educational career patterns. If non-standard educational careers are the result of re-entries into the labor market, the gains that can be achieved by additional education are important information for re-entrants: does it pay on the individual level to go back? Then however, if interruptions are delays, the more important information, in particular from a policy perspective, would be on the consequences of gaps.

Furthermore, in some instances is might be possible to rule out several of the mechanisms and draw conclusions on others, e.g. by directly controlling the stage of family formation.

Table 5.1.1: Empirical research questions for different perspectives on economic returns to educational careers.

Empirical research question	**Research design: corresponding comparison in figure 5.1.3**
Individual returns: are individuals gaining 'earning power' (Mincer, 1974) or 'employability power' by a marginal increase of their educational achievement?	(B-D)- (E-D); 'difference in difference'
Penalty or bonus at labor market entry: do individuals with educational careers deviating from the standard road do better or worse when entering the labor market?	A-B
Penalty or bonus for gaps and detours: do individuals with educational careers deviating from the standard road do better or worse at a certain age?	C-B

In the literature, the comparison between interrupters and non-interrupters is rarely considered compared to other aspects of non-traditional students' participation in higher education. This is unproblematic, as long as the standing of graduates at the time of the labor market entry is the central interest. Then, the comparison between A and B would be more relevant. This comparison enables to scrutinize on the role of previous detours for the immediate labor market entry after leaving school. It is thus a more suitable situation, e.g. to test the 'productivity'-driven mechanism of the human capital theory against the idea of educational signals. It can thus be argued to have a greater theoretical significance than the C-B comparison. However, for evaluating the contribution of educational career patterns, in particular stop-outs, to intergenerational inequality, the C-B-comparison is the relevant empirical question.

The aim of the following chapters is to fill existing gaps in the literature for two of the three countries. As the typical form of interruptions and detours in educational careers differ greatly between the country contexts, the relevant research questions differ too. In the US, a large number of studies exist (as reviewed above) scrutinizing on the labor market entry situation after different educational career

patterns. Reasons to do more research still exist. First, due to the contradictory results, which can be to some degree caused by differences in the methodological approach. Second, because the question on the total disadvantage at a certain age within one cohort is neglected by previous research. Hence, in particular the relevant question for evaluating the relevance of educational career patterns for inequality lacks empirical evidence. Furthermore, as many studies exist on the impact on income, for measuring stable economic disadvantage measuring economic positions by occupational outcomes, such as social class or prestige, would lead to stronger results. Chapter 5.2 aims at closing these gaps and refers to the impact of interruptions within educational careers on labor market outcomes, in particular occupational prestige.

The situation differs for Germany. Only very few studies have scrutinized the value of practical experience for graduates from higher education. And those that exist invite methodological more advanced replications to be carried out. As the typical patterns of educational careers differ, research from other countries is hard to transfer. Detours and gaps are less frequent in Germany, but if they occur they are usually longer. Furthermore, they are frequently coupled with the acquisition of an additional, vocational degree. Hence, the mechanisms underlying a penalty or a bonus in the A-B comparison have probably more leverage. For Germany, only few studies exist on either of the comparisons. In chapter 5.3 I will therefore present a study on the question how the completion of a vocational training before enrolling in higher education influences the labor market entry for graduates.

The lack of data does not allow adding a third country study on Sweden. There is, however, a series of recent and good studies for the Swedish context based on register data (which is not available for researchers not situated in Sweden). These can serve as a sound basis for final country comparative discussion in chapter 5.4.

5.2 You Snooze, you Lose? Returns to Interrupted and Delayed College Education in the US

This chapter refers to the US. The research question is whether delayed entries into and interruptions of educational careers of varying type and duration affect employment outcomes upon labor market entry. The situation of graduates and college-goers never completing is analyzed separately applying propensity score matching. The labor market outcomes studied are whether a job could be found which offers medical insurance, the logarithmized wage and occupational outcomes measured as Hauser and Warrens 1997 version of the Socio Economic Index (SEI). Results show that graduates with a B.A.-degree are not affected by their educational pattern. For incomplete college, the timing matters more. While there are small penalties for interruptions in general, small bonuses can be gained if the time out of the education system was spent with full time work.

In the US context, as the previous chapters have shown, interrupted educational careers and non-traditional students are frequent compared to e.g. Germany. Hence, it is not surprising that more published studies exist than in other contexts which address different questions on the labor market returns of graduates with different educational careers. Their findings, however, are somewhat inconsistent. Some find small penalties for delays and stop-outs, but others do not. And there are even studies finding (small) bonuses for graduates who interrupted their educational career or delayed their entry. In this chapter, I will address the question about the effect of interruptions in educational careers on labor market outcomes – adding several aspects that have not been discussed so far. By applying propensity score matching to account for the heterogeneity between 'interrupters' and 'non-interrupters', I will use a different statistical strategy. Furthermore, I differentiate the 'stop-out' and 'delay' more than previous studies did and compare the effects of gaps and delays of different duration and quality. Finally, I do not reduce labor market outcomes to wages as in most other studies. In addition to the wage at age 35, I also assess the impact on the occupational outcomes, operationalized using the socio economic index of Hauser and Warren (1997). Finally, social integration and social security in the US depend very much on the employment situation – and healthcare is an important aspect of social

security which is by far not universal. The fact that this constitutes an important dimension of inequality and social inclusion, beyond the question on the amount of returns, motivated me to add a third independent variable. I also test the effects on whether the respondent has employer-provided health insurance or not. This links the results closer to the debate on social inequality, since differences in occupational outcomes or access to health insurance at a time when most adults are fully established in the labor market can be seen as a more sustainable gap in the socio economic achievement than effects on wages shortly after graduation.

In line with previous assessments of returns to interrupted education, I find that overall effects are small. Among young adults with a B.A.-degree, no difference in any of the three outcomes at age 35 could be found once the comparison was limited to matched cases according to their propensity of having delayed/interrupted educational careers. Young adults with incomplete college education are affected more by interruptions. Delays are not found to be problematic at all – at least not at given levels of educational achievement and when conditioning on the propensity score. The duration of continuous interruptions or delays did not make any important difference. Differentiation of the interruptions according to activities, e.g. whether the gap was work- or family-related, led to small refinements of the conclusions, but not to a full clarification of the inconclusive findings from previous research. If delays are due to fulltime work, incomplete education that was attended afterwards did pay off more than incomplete educational careers that started right after high school.

5.2.1 Delays, Interruptions and Returns to Education: Selection Bias and Inconclusive Results for the US Context

Results from previous studies are inconclusive. Much of them discuss the problem of selection bias carefully, but very different tactics are applied to tackle it. This could be one reason for the contradictory results. In a seminal study Featherman and Carter (1976) addressed the question whether the timing and pattern of educational careers affect success in later educational attainment and the labor market. The authors postulate penalties for those students who interrupt their post-high school education due to a deviation from the *culturally specific normative pattern* of a straight and uninterrupted career. The findings however point towards only small effects of interruptions in postsecondary education on success in the labor market, while the impact on educational attainment seems to be large. Similarly, Griliches (1980) and

Marcus (1984) have both found no substantial disadvantage in terms of earnings for those who 'dropout for a while'. Monks found an equally negative but small effect for the age of graduation (Monks, 1997). For Sweden on the other hand, Holmlund et al. (2008) show that there is a wage penalty for graduates who interrupted postsecondary education, which they interpret as a hint that it is necessary to take the timing of human capital acquisition into account when estimating returns to education.

The central methodological concern of the debate around the question of causal consequences of interruptions of educational careers is the issue of unobserved heterogeneity. Even the early papers of Featherman and Carter as well as Griliches have discussed the problem of 'inert differences' between interrupters and non-interrupters. All of the studies mentioned so far have tried to address this problem by conditioning on a more or less rich set of observable variables. As always in such situations, there is at least a potential for the existence of further, yet unobserved, characteristics and hence biased results. Griliches therefore urges to look for 'interruptions by exogenous force', that could allow stronger conclusions. At least if this force is assigned independently from other factors that influence success in the labor market. In this situation, labor market bonuses or penalties could be attributed to the interruption in higher education. However, the caveat is that for a causal interpretation of interruptions per se, this same exogenous force may not affect labor market success itself. The latter condition seems to be such a substantial limitation of this approach that Griliches immediately admits that chances for finding such a natural experiment are very low. For example, all health related interruptions are more or less ruled out by the fact that health can affect success in the labor market at a great deal. Several decades after his paper has been published, there seems to be no study that can fulfill these strong criteria perfectly. Recent studies have attempted to come at least closer to such a natural experiment. Chenevert (2012) uses several instrumental variables in her study on graduates from a Master program in law. The instruments she employs are the 'unemployment rate in the year of college graduation', whether the 'individual was a business or economics major, and the interaction of both of these variables with the measures of relatedness of their occupation' (Chenevert, 2012, p. 21). Her findings by and large confirm the Swedish study. Interrupters receive a wage penalty, which decreases over time and is lower for those who interrupted education with field related work. The principal impossibility to test the assumption of 'no direct effect on labor market outcomes' however will

always leave some uncertainty about the results of such studies. The contrary is found by Ferrer and Menendez (2009) who apply a two stage least squares technique to model selection into the 'gap-group'. They even find a premium for interrupters in Canadian sample.

In sum, the previous literature on the question of returns to educational gaps and delays is inconclusive. Some authors found a premium, others found no effect and again others found a penalty. The contradictory situation can have different reasons. First and foremost, it is likely that flexible careers affect different populations in a different way. Some of the populations studied are rather specific. All of them are specific in their historical context. Second, interruptions and delays can imply very different forms of the actual educational career. The detours can be of very differing nature, in their duration, in the link to the content of studies and in their motivation.

This latter explanation calls for a closer look at a third issue that has often been ignored in previous studies. All of the interruptions can be related to specific reasons which are at the same time related to success in the labor market. For example, interruptions can be triggered by – both physical and mental – illness, by financial constraints in funding of college, by a very good labor market offer that makes further studies seemingly obsolete, by family formation such as marriage or childbearing, and by other things more. Previous research paid much more attention to inert individual differences of the respondents rather than heterogeneity in the treatment. However, the precise definition of the treatment 'interruption' can affect the results at least as much as unobserved heterogeneity. This aspect will need some more discussion, even though it cannot be solved completely with the dataset used for the present analyses. In the following, I will as well discuss why I expect labor market consequences of interruptions per se.

5.2.2 Delayed Education and Career Outcomes: Theoretical Expectations for Returns to Characteristics of Educational Careers in the US

The hypotheses for the US context can be derived from the general theoretical discussion without much further discussion: the human capital perspective expects a bonus or at best a non-effect, credentialism a non-effect and the signaling approach a negative signal for falling off the norm. What should be kept in mind when the signaling hypothesis is discussed though is that in the US context the value of

different levels of educational attainment as a signal varies strongly. The high number of college drop-outs floods the labor market with young adults having some college education, but no degree. For these cases, additional signals – such as interruptions and delays – should be more informative to employers than in cases where more powerful signals are available. The latter would clearly be the case after completion of a Bachelor-degree. Once an applicant holds a degree, employers would not have to rely on other, potentially weaker, signals. Therefore, a disadvantage for less steadfast and direct educational careers should only emerge for young adults without B.A.-degree.

5.2.3 Data and Methods

Operationalizing interruptions in educational career patterns must to some degree deal with the fact that the interruptions differ in many aspects, e.g. in duration and frequency. Although there are many characteristics, the simple dichotomy of interrupters/non-interrupters is the standard operationalization in the literature. It would be ideal to capture more characteristics of the sequence, and at the same time the qualitative differentiation in various activities would need to be considered in more detail. However, the sample size for the subsequent analysis of the NLSY79 is too small to be analyzed in greater detail. Starting from the simple dichotomy I differentiate stop-outs in two rather simple ways. First, I distinguish different durations by defining a stop-out alternatively as a continuous interruption of 6, 12 and 24 months of the educational career. The same set of different durations is generated for delays. Second, I distinguish between interruptions regardless of their nature, interruptions where the respective time was spend in fulltime work and interruptions that were not spend in fulltime work.

For my empirical study I analyze data from the four youngest birth cohorts of the National Longitudinal Study of Youth 1979 (see chapter 1.5). All outcome variables are measured as averages of the 36th year of the respondents' life. Educational achievement and career sequences were all measured before completion of the 30th year of their life, so that there is a gap of at least five years between measuring educational participation and the outcomes for every individual[40]. In addition to the wage as an outcome which was used by most other studies before, I

[40] Within this period, only very few respondents acquire additional college education.

analyze occupation based socio economic positions measured according to the socio economic index SEI (Hauser and Warren, 1997). While income can change rapidly among young adults, the SEI is a rather stable representation of the socio economic position in the labor market. A penalty in SEI in the mid-thirties should allow stronger conclusions on the contribution to social inequality by 'educational snoozing' than differences in mean income. All analyses are replicated using occupational earnings as well as occupational education. Since this does not lead to different conclusions, I will limit the presentation of results to the SEI for this chapter.

The problem of selection into different types of educational careers bares a substantial potential for misinterpreting the effects of interruptions and delays as causal. As discussed above, different attempts have been made to correct for the heterogeneity between the 'treated' group having stop-outs and the 'control' group with straight educational careers. Some authors have based their approach on attempts to model the unobserved heterogeneity; others have accounted for observed differences between the two groups in multivariate regression analyses. As the NLSY dataset offers a very broad and rich set of covariates that can capture many important potential sources of heterogeneity, I will follow the second approach and account for 'observables'. In order to compare graduates that are as alike as possible to their counterparts with a different educational career, I estimate propensity scores for each type of interruption or delay and then match respondents who have the respective gaps in their educational careers to most similar cases who do not have. Between these two groups, the outcome variables are compared. To match the observations in both groups, I apply a kernel-matching procedure (Epanechnikov-kernel) since the number of cases in the sample would not allow for stricter but less efficient techniques (Becker and Ichino, 2002; Guo and Fraser, 2010; Morgan and Winship, 2007). An advantage of propensity score matching over regression is the detection of common support. Only if similar cases in both groups do indeed exist, the comparison between treatment and control group will be made.

As discussed above, the effects of interruptions could depend on the type of interruptions. If interruptions per se are a too broad concept that captures too many different things which have their own impact on labor market success, the overall effect would be a vague mix of different causes. In the NLSY79, students who dropped out from college were asked for the reason for dropping out. This could principally serve as useful information for differentiating different interruptions, but

the number of cases for the different drop out-reasons – such as ‘found good job’ or ‘gave birth to a child’ – are too small. Therefore, only one further differentiation of interruptions will be made for this chapter: whether the detour was related to fulltime work or not. For an operationalization of this, I introduce a new set of two treatment variables. First, if the person had interrupted its education engaging in fulltime work. Second, whether there was an interruption that was not spent by working fulltime at all.

A large set of covariates can be used to predict propensities in the assignment models for all treatments to arrive at a comparison between cases that are as similar as possible. Most importantly, the personal situation in the family, academic performance before going to college and other individual characteristics – that can be both related to school attendance and to labor market performance in young adulthood – are included. In addition, a set of covariates about the educational career itself is included into the assignment model. This comprises the type of college and the progress of family formation at age 22 and age 30 as well as the total work experience that was gained before the outcome is measured. Finally, I account for military enlistment to finance college[41]. For most models (whenever a sufficient number of cases was available), additional interaction effects were used to improve the balancing of the matching. A descriptive overview over the covariates and their distributions in the model can be found in table 5.2.1. An exemplary assignment model can be found in table 5.2.8 in the appendix of this chapter.

[41] Principally, these variables are measured at least to some degree simultaneously with the treatment, but not entirely. A better way of accounting for them would be stratified matching – i.e. separate analysis of the different populations. However, due to the small number of cases in each type of educational experience I prefer to include them into the assignment model.

Table 5.2.1: Covariates of assignment models and their distribution for the full samples of graduates and drop-outs respectively.

variable	graduate-sample % / mean (SD)	dropout-sample % / mean (SD)
dependent variables:		
SEI @ age 35	68.56 (13.02)	38.43(12.81)
yearly labor income @age 35 in US$	49902.16 (58430.06)	23728.55(29962.7)
Having medical insur. through employer @ age 35	81.43	73.21
high school and test scores		
test score: asvab battery percentiles	75.92 (20.30)	55.57(24.61)
GED instead of high school diploma	1.29	9.69
date of high school or GED achievement	not meaningful to report	not meaningful to report
academic track in high school	58.88	38.81
ever been suspended from school	5.67	15.78
personal characteristics		
sex: male	50.88	48.63
birth cohort (born 1961, 62, 63 or 64)	all ~25%	all ~25%
race		
white	89.22	77.22
black	7.86	16.17
hispanic	2.92	6.61
rural residence @ age 14	17.90	23.29
residence: south US @ age 14	29.72	32.42
religion/confession		
none	3.59	3.31
others	36.36	31.98
baptist	13.10	24.76
methodist	12.37	7.01
roman catholic	34.58	32.93

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--- table 5.2.1 continued

family of origin characteristics		
fathers class position		
service	43.28	23.38
intermediate	12.03	12.47
skilled working	16.85	19.86
unskilled working	9.91	21.34
inactive	8.41	9.65
no man present	9.53	13.30
household @ age 18: poor	7.26	17.26
foreign language @ home during childhood	10.88	12.95
broken family	16.20	24.29
age 14: hh-member rcvd newspaper	91.90	86.42
age 14: hh-member had library card	84.96	77.81
working career, family formation and study characteristics		
first college: 2 year college	21.86	58.54
any time enrolled in 2 year college	31.04	71.84
any time in part time college	56.65	61.31
child birth before high school degree	0.87	5.99
child birth before age 22	4.80	24.65
child birth before age 30	42.64	62.23
marriage before age 22	16.33	37.16
marriage before age 30	68.56	74.01
total work experience until age 35 (in 1000hrs)	24.16 (7.88)	21.99(9.98)
(total work experience until age 35)²	not meaningful to report	not meaningful to report
military enlistment for college finance	2.81	8.83
values, expectations and personality		
'a woman should stay at home with her family'		
strongly disagree	35.60	30.46
disagree	47.57	48.79
agree	14.04	16.88
strongly agree	2.79	3.86
intend to work after finishing education: NO	2.92	3.66
Rotter Scale: Locus of Control 1979	8.22 (2.20)	8.69
Self Esteem Score 1980	23.17 (3.88)	22.69

Data source: NLSY79. Own calculations, weighted analysis.

5.2.4 Delays and Stop-Outs

In sections 2 and 3 delays and stop-outs have been described in detail – including the finding that lower class children are particularly often affected. In the literature on the impact of stop-outs and delays on later labor market success, however, interruptions are operationalized in the much more simplistic way of only distinguishing between 'interrupters' and 'non-interrupters'. This dichotomous variable will be my starting point in this chapter too[42]. Table 5.2.2 reports the percentage of delayers – among graduates from a B.A.-degree and among those with incomplete college. On first sight, it reproduces the finding of previous studies of lower chances of completion after delays and stop-outs: among the B.A.-degree graduates, delays after college are very uncommon. Even a slight delay of 6 months applies to only 14 percent of those achieving a B.A.-degree until age 30. This picture is completely different for young adults with 'some college' as their educational achievement until age 30. Almost half of them started their college career after a delay of at least 6 months after high school – almost a third has a continuous delay of 2 years before enrolling. This strong difference in occurrence of delays justifies a separate treatment of the two groups: B.A.-degree graduates and adults who enter the labor market with incomplete college. In the columns printed in grey, incomplete college is split into different durations. The respective cells show that the share of delayed entry does not differ much according to the amount of education gathered later. The major difference is completion of a B.A.-degree.

Table 5.2.2: Delays in enrolment given educational achievement at age 30.

Educ. career delayed for…	B.A.-degree (before age 30)	delay: 12 to less than 48 months	delay: 12 to less than 24 months	delay: 24 to less than 36 months	delay: 36 to less than 48 months
…6 months	14.01 %	44.35 %	48.63 %	39.55 %	42.47 %
…12 months	10.89 %	37.22 %	42.07 %	32.46 %	34.23 %
…24 months	8.21 %	30.27 %	34.08 %	27.15 %	27.16 %
N	898	928	437	283	208

Source: NLSY79; own calculations, results weighted.

[42] More advanced methods might be suitable to improve the operationalization of educational career structures, such as the number of transitions between the states 'enrolled' and 'not enrolled' in the same period of time. Several examples are given in section 2 and chapter 3.1 which could be turned into independent variables. However, the sample sizes are too small for making use of the additional information which might be gained by the sequence analysis measures.

For gap within educational career, I find a somewhat different situation compared to the delays of first entry. The results shown in table 5.2.3 reveal that the difference between graduates with B.A.-degrees and incomplete college graduates is not as significant as in the case of the delays. Still, interruptions are much more frequent in the case of incomplete college education, and it is noteworthy that long interruptions are not frequent among those who receive a degree, but by far less uncommon among those with incomplete education.

Table 5.2.3: Stop-outs/gaps given educational achievement at age 30.

Educ. career interrupted for…	B.A.-degree (before age 30)	gaps: 12 to less than 48 months	gaps: 12 to less than 24 months	gaps: 24 to less than 36 months	gaps: 36 to less than 48 months
…6 months	25.83 %	39.09 %	26.23 %	44.55 %	56.98 %
…12 months	14.92 %	28.81 %	18.99 %	34.52 %	39.80 %
…24 months	8.22 %	21.88 %	12.13 %	26.36 %	34.26 %
N	898	928	437	283	208

Source: NLSY79; own calculations, results weighted.

A strong difference appears when incomplete education is broken down into different total durations of participation in higher education. The respective numbers are reported in the columns printed in grey. The longer the duration of attendance in the education system is, the higher the percentage of interrupters. This is reasonable since the statistical chance of interruption is higher for those going to college for a longer period – simply because there are more chances for interruptions and because all re-entrants add more education and an interruption to their CV. Comparing young adults being close to degree completion to those who actually have completed a degree, a similar picture as in the case of delays emerges: incomplete education is closely linked to interruptions in the educational career. The distribution of delays and interruptions underlines the divide between traditional and non-traditional educational careers in the US. Therefore a separate estimation of the results by educational achievement seems necessary. Since the total duration is strongly related to interruptions, the following analyses were all computed separately for different durations of education, which did not alter the results substantially.

5.2.5 Results

The results of the propensity score matching are summarized in tables 5.2.4 to 5.2.7. An exemplary assignment model for documentation can be found in 5.2.7, the Appendix of this chapter. Without conditioning the comparison on the propensity score a disadvantage of ‘delayers’ and ‘interrupters’ would be found for most cases. The values in table 5.2.4 are the conditioned comparisons based on a comparison of cases with similar propensity scores (ATT derived from kernel-matching). Analytical t-values are given in brackets. Empty cells indicate that there were not enough cases in the treatment category that fall into the common support area to estimate the ATT (Morgan and Harding, 2006; Morgan and Winship, 2007).

Overall, the effect sizes and also the analytical t-values are very small – and inconsistent in their direction. In a way, they resemble the results of previous articles: small effects which are inconsistently either positive or negative. For young adults with incomplete education, those who delay their enrollment have on average a penalty of two SEI-points for delaying their entry into college (table 5.2.4). This, however, reverses when conditioning on the propensity score. All else equal, the late entrants even receive a bonus compared to their most similar peers entering directly. Furthermore, this effect does not exist for other outcomes than the SEI. Differences in monetary returns and the social security turn very small when they are estimated as ATT. It is important to note that the duration of the treatment does not matter much. The results differ somewhat when the ‘activity’ during and the reason of the interruption are regarded when constructing the treatment variable. In the lower rows of tables 5.2.4 to 5.2.7 the ATT-coefficients are reported that interruptions or delays have on the respective outcomes when being spent in fulltime work (continuously). Thus, the effect of delays in the overall model is driven by those who work fulltime before enrolling. The same result is found for the health insurance-outcome: those who enter fulltime work before enrolling are more likely to receive it as a fringe benefit from their employer. On the other hand, there are no substantial effects on the wages.

As table 5.2.4 shows, interrupting college education has a different impact on later labor market outcomes than delaying enrollment. Again, effects on the health insurance status do not exist in this sample. But the SEI is attenuated by an interruption in the educational career by roughly two points. This effect is again

driven by the work-interruptions, and much less by interruptions for other reasons. Effects on income are similar to the ones on the SEI, but not statistically significant.

Table 5.2.4: Gross differences and ATT between delayed and on-time educational careers in various labor market outcomes – labor market entrants with incomplete college education.

	SEI	Ln(yearly income)	Health Insurance
6 months			
unmatched (t-value)	-2.01 (-2.03)	-0.36 (-3.81)	0.01 (0.43)
ATT [bootstr. z-value]	2.18 [1.68]	-0.16 [-1.28]	0.03 [0.71]
off common support	0	1	1
12 months			
unmatched (t-value)	-2.62 (-2.55)	-0.37 (-3.77)	-0.01 (-0.21)
ATT [bootstr. z-value]	1.68 [x]	-0.20 [-1.44]	0.04 [0.92]
number of obs.	754	696	784
off common support	1	1	7
6 months: not working			
unmatched (t-value)	-1.75 (-1.31)	-0.29 (-2.32)	0.07 (1.59)
ATT [bootstr. z-value]	1.85 [1.34]	0.09 [1.70]	0.10 [2.09]
off common support	0	0	0
12 months: not working			
unmatched (t-value)	-4.56 (-3.65)	-0.48 (-3.98)	-0.08 (-1.85)
ATT [bootstr. z-value]	1.62 [x]	-0.13 [0.82]	0.06 [0.99]
off common support	2	3	6
6 months: fulltime work			
unmatched (t-value)	0.79 (0.66)	-0.03 (-0.25)	0.12 (3.07)
ATT [bootstr. z-value]	2.45 [1.72]	0.02 [0.17]	0.10 [2.34]
off common support	6	3	4
12 months: fulltime work			
unmatched (t-value)	2.71 (1.97)	0.04 (0.27)	0.12 (2.66)
ATT [bootstr. z-value]	4.37 [x]	0.14 [-0.93]	0.07 [1.36]
off common support	1	2	4
N	754	696	784

Source: NLSY79; own calculations, not weighted.
x: Bootstrap for z-value failed, ATT should be assumed to be not significant.

Table 5.2.5: Gross differences and ATT between interrupted and continuous educational careers in various labor market outcomes – labor market entrants with incomplete college education.

Interruptions:		SEI	Ln(yearly income)	Health Insurance
6 months				
	unmatched (t-value)	-2.22 (-2.28)	-0.15 (-1.56)	-0.02 (-0.47)
	ATT [bootstr. z-value]	-2.43 [-2.00]	-0.09 [-0.71]	-0.02 [-0.55]
	off common support	6	3	7
12 months				
	unmatched (t-value)	-2.24 (-2.14)	-0.21 (-2.05)	-0.03 (-0.74)
	ATT [bootstr. z-value]	-2.58 [x]	-0.21 [-1.65]	-0.01 [-0.16]
	off common support	0	0	2
6 months: not working				
	unmatched (t-value)	-2.34 (-2.30)	-0.33 (-3.33)	0.00 (0.07)
	ATT [bootstr. z-value]	0.61 [0.52]	-0.07 [-0.52]	0.05 [1.22]
	off common support	5	0	4
12 months: not working				
	unmatched (t-value)	-4.03 (-2.68)	-0.37 (-2.52)	-0.14 (-2.98)
	ATT [bootstr. z-value]	-1.45 [x]	-0.03 [-0.14]	0.06 [0.68]
	off common support	9	8	3
6 months: fulltime work				
	unmatched (t-value)	-0.87 (-0.80)	-0.03 (-0.26)	0.00 (0.05)
	ATT [bootstr. z-value]	-2.04 [-1.91]	-0.19 [-1.57]	-0.04 [-1.15]
	off common support	1	0	2
12 months: fulltime work				
	unmatched (t-value)	-0.59 (-0.49)	-0.08 (-0.67)	0.02 (0.61)
	ATT [bootstr. z-value]	-2.82 [x]	-0.23 [-1.63]	-0.03 [-0.62]
	off common support	0	1	1
N		754	696	784

Source: NLSY79; own calculations, not weighted.
x: Bootstrap for z-value failed, ATT should be assumed to be not significant.

Tables 5.2.6 and 5.2.7 report the equivalent values to the tables above for labor market entrants with a completed Bachelor-degree. Effects are now much smaller in size compared to the drop-outs, and all over board not statistically significant. The only exception is the significant positive effect of longer interrupters (12+ months) on having a health insurance. This is, however, not consistent with the findings for shorter interruptions and should thus be treated with caution.

Differentiating the effects into work and non-work detours fails in the case of graduates. The reason is simple and consistent with previous literature: those interrupting or delaying are unlikely to complete college – and thus unlikely to select into our sample (Bozick and DeLuca, 2005; Roksa and Velez, 2012). Therefore, the number of interrupters in the sample is too small to estimate an ATT. Those cells for which the estimation is not possible are marked in grey.

Table 5.2.6: Gross differences and ATT between delayed and on-time educational careers in various labor market outcomes – labor market entrants with Bachelor degree.

Delay, graduates:		SEI	Ln(yearly income)	Health Insurance
6 months				
	unmatched (t-value)	1.03 (0.64)	-0.58 (-1.32)	-0.01 (-0.28)
	ATT [bootstr. z-value]	1.02 [0.50]	-0.51 [-0.92]	0.01 [0.13]
	off common support	0	0	0
12 months				
	unmatched (t-value)	0.50 (0.27)	-0.68 (1.34)	0.02 (0.42)
	ATT [bootstr. z-value]	0.29 [0.13]	-0.44 [-0.66]	0.04 [0.69]
	off common support	0	0	1
6 months: not working				
12 months: not working				
6 months: fulltime work				
12 months: fulltime work				
N		642	591	658

Source: NLSY79; own calculations, not weighted.
x: Bootstrap for z-value failed, ATT should be assumed to be not significant.
Grey: not enough cases on common support for estimation of ATT.

Table 5.2.7: Gross differences and ATT between interrupted and continuous educational careers in various labor market outcomes – labor market entrants with Bachelor degree.

Interruptions:		SEI	Ln(yearly income)	Health Insurance
6 months				
	unmatched (t-value)	0.70 (0.56)	-0.10 (-091)	0.03 (0.94)
	ATT [bootstr. z-value]	1.93 [1.29]	-0.06 [-0.29]	0.08 [1.54]
	number of obs.	638	530	656
	off common support	6	7	6
12 months				
	unmatched (t-value)	-0.05 (-0.03)	-0.15 (-1.10)	0.10 (2.09)
	ATT [bootstr. z-value]	0.61 [0.14]	-0.07 [-0.32]	0.13 [2.59]
	number of obs.	634	527	653
	off common support	1	0	0
6 months: not working				
	unmatched (t-value)	0.54 (0.25)		0.02 (0.29)
	ATT [bootstr. z-value]	0.91 [0.27]		0.11 [1.12]
	number of obs.	632		650
	off common support	3		3
12 months: not working				
6 months: fulltime work				
	unmatched (t-value)	-0.71(-0.41)	-0.22 (-1.48)	0.06 (1.15)
	ATT [bootstr. z-value]	-1.21 [-0.64]	-0.25 [-1.19]	0.02 [0.45]
	number of obs.	637	529	655
	off common support	1	0	1
12 months: fulltime work				

Source: NLSY79; own calculations, not weighted.
x: Bootstrap for z-value failed, ATT should be assumed to be not significant.
Grey: not enough cases on common support for estimation of ATT.

In sum, the results show that the impact of gaps and delays on SEI in the mid-thirties is low to non-existent once potential confounding factors are taken into account. However, there are some exceptions: a penalty of about two SEI points for interruptions for those who leave college without a degree; and a bonus for delayers without a degree if the delay is used for fulltime work.

5.2.6 Conclusion

One disadvantageous consequence of delayed and interrupted educational careers on the individual level could be lower-status positions in the labor market. These would be even more problematic if they persisted into the mid-thirties. This chapter has set out to empirically test whether such a 'penalty for snoozers' exists. If these would be large, the consequence would be that catching-up in educational achievement is to be seen as a rather ineffective way of reducing earlier disadvantages in educational attainment.

The descriptive summary repeats the conclusion of earlier chapters: delays and interruptions are very common among college students in the US. They most often affected group are students who do not completed their education with a degree, which also implies that they are strongly related to college drop-out. A number of studies had already attempted to estimate the disadvantage for interruptions and delays in terms of wages or income – using various datasets and methodological strategies. The results were inconclusive, but the resulting differences generally small. This finding can be confirmed by analyses I presented in this chapter: a rather small penalty for interruptions and a small bonus for delays spent in fulltime work – among college drop-outs. There is no impact on the labor market entry of graduates with at least a B.A.-degree. This, however, rarely happens among students whose educational careers are characterized by delays and stop-outs. Hence, if non-traditional students manage to complete a degree, there will be no sustainable disadvantage on the labor market except for the opportunity costs. Then again, they often do not, and in this case a stop-out seems to lead into somewhat lower positions.

This finding supports the signaling perspective: employers seek for signals about the performance and the training potential of applicants. A B.A.-degree is a strong signal – independent of gaps in the educational career. They only become important if such a strong signal is missing. In this case, the steadfastness and

consistency of a college visit can serve employers as a signal – e.g. for the motivation to learn. It contradicts the human capital perspective that the amount of education determines the returns. Assuming that completion is in many cases correlated with social origin, it follows that negative effects (even though small) mostly occur among college students from lower class backgrounds.

Late re-enrollers on the other hand have slightly better jobs in their mid-thirties among those who never graduated. Different explanations could apply to this finding. First of all, it is possible that the later students left college at the time of a better labor market situation and hence had a better start into their work career after dropping out. This explanation would, however, not be consistent with the finding that there is no additional bonus for students with a degree. An alternative explanation would be a better-informed choice of the study program. To exemplify, later entrants could chose vocational oriented programs according to their knowledge of skill-requirements in the labor market and hence have a better match of the demand and their own abilities (cf. Oettinger, 1993 for a similar argument).

The inconsistency between previous studies cannot be fully solved by my analyses. Modeling heterogeneity using a large set of covariates leads to by and large similar results of other studies on early income. The SEI results are somewhat stronger than the labor income models. For the basic social security standard of a health insurance, the college career was less important. The differentiation and reformulation of the definition of ‘interruption’ did also not result in a comprehensive clarification of contradictions emerging from previous research. Varying the minimum duration of interruptions does not lead to different findings compared to the conventional 6 months. Restricting the definition of the central independent variable to fulltime work-delays or -interruptions does matter. Hence, a further differentiation of the treatment variable – if possible with larger datasets allowing for more differentiation including family-formation related interruptions – should have some potential of further clarifying the somewhat contradictory findings.

5.2.7 Appendix

Table 5.2.8: Exemplary assignment models for estimation of the propensity of having the respective treatment (6 months duration) in both relevant populations.

Probit regression	**B.A.**				**No B.A.**			
	model 1 (delay)		model 2 (interrupt)		model 3 (delay)		model 4 (interrupt)	
	coef.	z-value	coef.	z-value	coef.	z-value	coef.	z-value
fathers class position:								
service classes	ref. cat.							
intermed. classes	-0.20	(-0.78)	-0.06	(-0.25)	0.15	(0.79)	-0.24	(-1.39)
skilled working cl.	-0.03	(-0.16)	0.14	(0.74)	0.16	(0.34)	-0.23	(-1.44)
unskilled working cl.	0.02	(0.07)	0.17	(0.77)	0.27	(1.64)	-0.36	(-2.30)
inactive	-0.12	(-0.42)	-0.01	(-0.02)	0.22	(1.15)	-0.52	(-2.76)
no man present	0.55	(1.36)	0.14	(0.44)	-0.02	(-0.10)	-0.28	(-1.26)
date of HS diploma/GED	0.01	(0.68)	-0.01	(-0.57)	-0.01	(-2.98)	-0.007	(-1.50)
sex: male	-0.14	(-0.87)	-0.15	(-0.94)	-0.15	(-1.14)	0.06	(0.46)
yr of birth								
1961	ref. cat.							
1962	0.64	(1.62)	-0.51	(-1.20)	-0.31	(-1.58)	-0.41	(-1.86)
1963	0.66	(2.07)	-0.27	(-0.87)	-0.25	(-1.43)	-0.23	(-1.25)
1964	0.61	(2.49)	-0.22	(-1.03)	-0.19	(-1.18)	0.02	(0.10)
race:								
white	ref. cat.							
black	-0.41	(-1.61)	-0.06	(-0.24)	-0.67	(-3.60)	0.37	(2.05)
hispanic	-0.15	(-0.47)	0.20	(0.73)	-0.18	(-0.77)	0.21	(1.03)
GED instead of HS dipl.					0.82	(3.68)		
poor household @ age 18					0.21	(1.33)	-0.25	(-1.52)
percentiles: afqt-score	-0.00	(-1.10)	-0.00	(-0.53)	-0.00	(-3.91)	0.00	(1.14)
any newspapers in the household @ age 14	-0.15	(-0.64)	0.19	(0.88)	0.09	(0.69)	-0.07	(-0.53)
library card in the household @ age 14	0.12	(0.58)	0.04	(0.22)	-0.07	(-0.59)	-0.23	(-1.94)
locus of control: Rotter-scale	0.02	(0.70)	-0.01	(-0.33)	0.02	(0.77)	0.01	(0.26)
self-esteem score	0.001	(0.06)	-0.01	(-0.31)	-0.003	(-0.22)	-0.002	(-0.14)
'a woman should stay at home with her family'								
strongly disagree			0.13	(0.65)				
disagree	0.17	(0.73)	-0.10	(-0.53)	0.22	(1.91)	-0.09	(-0.82)
agree	0.17	(0.74)			0.30	(1.86)	-0.18	(-1.15)
strongly agree					-0.15	(-0.59)	-0.22	(-0.87)
intend to work after finishing education: no					-0.02	(-0.08)		

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--- table 5.2.1 continued

total work exp. until age 35	0.02 (0.32)	-0.09 (-2.24)	-0.04 (-1.07)	-0.02 (-0.75)
total work exp. until age 35, squared	-0.001 (-0.73)	0.001 (2.43)	0.001 (1.70)	0.000 (0.47)
academic track in high school	-0.05 (-0.34)	0.05 (0.38)	-0.08 (-0.70)	0.03 (0.22)
foreign language at home during childhood	0.17 (0.27)	-0.24 (-1.05)	-0.13 (-0.68)	0.14 (0.77)
broken family	-0.43 (-1.28)	0.25 (1.06)	0.32 (1.98)	0.14 (0.86)
residence: rural area @ age 14	0.05 (0.29)	-0.12 (-0.73)	0.09 (0.68)	-0.13 (-1.02)
residence: south US @ age 14	-0.02 (-0.09)	0.181 (1.26)	-0.07 (-0.61)	0.05 (0.45)
religious denomination				
none	ref. cat.			
others			0.16 (0.52)	-0.28 (-0.90)
Baptist			-0.13 (-0.87)	-0.09 (-0.64)
methodist			0.32 (1.94)	-0.01 (-0.06)
catholic			-0.16 (-0.72)	-0.16 (-0.80)
family formation				
childbirth before age 22	0.17 (0.58)	0.63 (2.31)	0.47 (3.12)	0.17 (1.14)
childbirth before age 30	-0.004 (-0.02)	-0.15 (-0.94)	-0.03 (-0.22)	-0.04 (-0.31)
childbirth before high school degree completion			0.03 (0.11)	-0.27 (-1.16)
marriage before age 22	0.38 (1.89)	0.19 (1.01)	0.18 (1.41)	-0.16 (-1.28)
marriage before age 30	-0.17 (-0.92)	-0.26 (-1.66)	-0.20 (-1.52)	0.06 (0.50)
interaction: race=black X sex=male		0.43 (1.46)	-0.05 (-0.24)	-0.20 (-0.92)
interaction: poor X academic track		-0.57 (-1.74)	-0.20 (-0.77)	0.20 (0.77)
Collist	0.50 (1.30)	1.08 (2.87)	0.88 (4.12)	0.61 (2.98)
ever suspended from school		0.29 (1.31)	0.48 (3.43)	-0.05 (-0.35)
first college entered = 2 year college	0.47 (1.76)	0.26 (1.20)	0.10 (0.67)	-0.45 (-3.15)
ever enrolled in 2 year college	-0.01 (-0.05)	0.36 (1.85)	0.03 (0.22)	0.78 (5.20)
ever enrolled in part-time program	0.03 (0.18)	0.59 (4.36)	0.42 (3.99)	0.71 (6.80)
delayed entry: at least six months		0.32 (1.75)		
constant	-8.03 (-0.81)	6.06 (0.55)	11.63 (2.85)	6.74 (1.36)
N	642	638	876	876

Source: NLSY79; own calculations.

5.3 The More the Better? Multiple Degrees and Their Returns in Germany

This chapter studies the returns to the an important part of the educational detours taken in the German system which is otherwise characterized by rather few deviations from the national standard educational career (see section 2). This case is particular useful for scrutinizing common theoretical explanations for the pay offs of education in the labor market. Empirically, the additional education from a vocational degree does not pay off much, but some evidence for a smoother transition of graduates with problematic labor market outlooks is found. This supports the view that human capital alone cannot explain the payoffs of education in the labor market. Entry routes into job are channeled by education in more ways than increasing the productivity, which is in line e.g. with signaling and credentialism approaches.

For each society, effects of interruptions in educational careers depend on which interruptions occur in a given society. The German case is special with respect to the most frequent type of interruptions. The inflexible educational career regime (section 2 in this volume) leads to comparatively straight educational careers, with the exception of a noteworthy number of young adults completing both vocational training and higher education (Hillmert and Jacob, 2004; Jacob, 2004) and university drop-outs (Müller and Schneider, 2012). In comparison to the US, however, the number of drop-outs is lower. The labor market is rarely entered before obtaining any vocational education degree, either from higher education or in the vocational training system. Between 2000 and 2008, approximately a quarter of all students being eligible to enter higher education were in vocational training (mostly apprenticeships) half a year after leaving secondary school (Heine and Quast, 2009). A recent series of papers have dealt with possible motives for this double qualification. One of the results from previous studies is that in particular lower class youth move through the educational system in this sequence (Becker and Hecken, 2009b; Hillmert and Jacob, 2003; Jacob, 2004). Heine and Quast (2009) report for the years between 2000 and 2008 numbers between 15 and 20 percent for the share of young adults who are qualified for entering higher education directly but aim for both a vocational and a

higher education degree. Thus, interruptions are most often the result of multiple degrees obtained in a row. And therefore the relevant question with regard to the effects of interruptions in educational careers on the labor market returns in Germany is rather a question about the effects of vocational training in addition to higher education.

Empirically, it could be shown that double qualifications are more often planned by young adults with lower educational background – in the same way as other educational detours (Becker and Hecken, 2009b, chapter 4.1 in this volume). However, for many young adults completion of an apprenticeship vocational degree is not the end of their educational career. Every year, a certain share of graduates from vocational training who are eligible to higher education enroll into the tertiary level education later (Bellmann, Hall and Janik, 2008).

Just as for the US, earlier studies on the German context have not led to consensus about the empirical question of returns to vocational degrees before higher education. Büchel and Helberger (1995) and Bellmann et al. (1996) find no premium for the additional education. In response to them, Lewin et al. (1996) report that graduates with double qualifications are as fast or even faster in graduating and finding a job afterwards. Furthermore, they claim that the vocational training compensates for a lack in practical, vocational content in higher education and that these graduates are more satisfied with their first jobs. All of these findings are based on bivariate analyses, only separated by field of study. Büchel (1997) summarizes both of the studies and points out that the differences in the results stem from conceptual and methodological differences. Several contradictories in the studies remain after his discussion. Furthermore, both methodological approaches are not able to account for the manifold differences that could select young adults with different characteristics into the different educational career patterns. Given the differences between double-qualifiers and graduates from higher education with a straight career, a causal interpretation of the results should be questioned.

While the basic mechanisms discussed at the outset of this section have similar explanatory grip, there are also differences to the US which have to be considered when theoretically explaining the effects of detours in the German context. A major difference is that the German labor market is rarely entered without any vocational degree. Stop-outs just for work before having any kind of degree are therefore infrequent. In most cases, they are the result of completing a vocational

education degree before entering higher education. In the US the Bachelor-degree made the difference; work experience did not matter much further on. In Germany, not only additional work experience, but also an additional but lower-level vocational degree is obtained during an interruption period. This constitutes a very interesting case for the signaling approach. Unlike the interruptions and delays in the US, the double degrees in Germany are detours that consist of time spend in education. Thus, there is a deviation from the 'norm-pattern', but also more human capital is accumulated. Consequentially, in Germany a negative effect would contradict the human capital perspective. The German case thus corresponds much closer e.g. to the analyses of Groot and Osterbeek (1994) on the effect of educational detours, or that of Bills (1992) on over-education than the previous chapter on the US. The resulting human capital hypothesis is the same: more years in education are not penalized and on average should even lead to a bonus (Hypothesis 1). A penalty for a double qualification after keeping all else equal would be support for the signaling hypothesis (Hypothesis 2).

Furthermore, the German labor market follows a different tradition of rewarding degrees. Other than in the US, in particular in the lower sectors, the linkage between occupational titles and educational programs are close (Kerckhoff, 1996; Kerckhoff, 2000; Maurice, Sellier and Silvestre, 1986). Without vocational education the odds of finding a job are rather low. In such a system, the vocational degree can fulfill another function. According to credentialism an additional degree from education can be seen as an additional license allowing entering another type of position in the labor market. If occupations are to some degree closed by licenses, having another degree would increase the chances of finding a job by one additional potential position. In this case, the vocational degree can work as a safety net for risk-averse students. This insurance utility is one hypothesis in the debate on the question why double qualifications are obtained at all: risk-averse young adults do not dare to enter higher education without having a fallback option into another job (Becker and Hecken, 2009b; Büchel and Helberger, 1995). The insurance strategy-argument, i.e. that young adults get an additional degree only with the motivation to have a safety net in the case of failure, is closely related to the mechanism of credentialist hiring in the German labor market. This second option would be used if higher education or the job search after graduation fails. And since the German dual vocational education system is known to offer a particular smooth way into the labor market (Gangl,

Müller and Raffe, 2003; Müller and Shavit, 1998b; Scherer, 2005), this strategy should work. On the other hand, if the labor market would allow entering skilled jobs without vocational degree, such insurance would not be needed. The cost for such a buffer would be high and the strategy therefore irrational, since it is unlikely that graduates have to search for a job for the same time period it takes them to complete a vocational degree (normally two years). Furthermore, the vocational training could in theory also be completed after failing in higher education. But it is known from descriptive studies by the HIS (Heine, Spangenberg and Sommer, 2004; Heine and Willich, 2006), that quite a number of double-qualifiers have planned the entire sequence from the beginning.

The German context therefore offers a number of straightforward implications that allow developing empirically testable hypotheses on credentialism. If vocational training provides an alternative route into the labor market after graduation from higher education, this should lead into lower, less skilled jobs. The safety net would thus not be used if a job can be found based on the higher education degree. But it would help to avoid unemployment. Thus, we can expect for those graduates who have a vocational degree:

- a reduction in the search time until the first job (Hypothesis 3). If no job can be found, those with a vocational degree have the option of searching their previous occupation.
- A higher risk of being overeducated in their job (Hypothesis 4), because some graduates go back into their old occupation.
- Among the overeducated, the vocational training should pay off with higher wages, since their degree pays off in the unskilled labor market (Hypothesis 5).

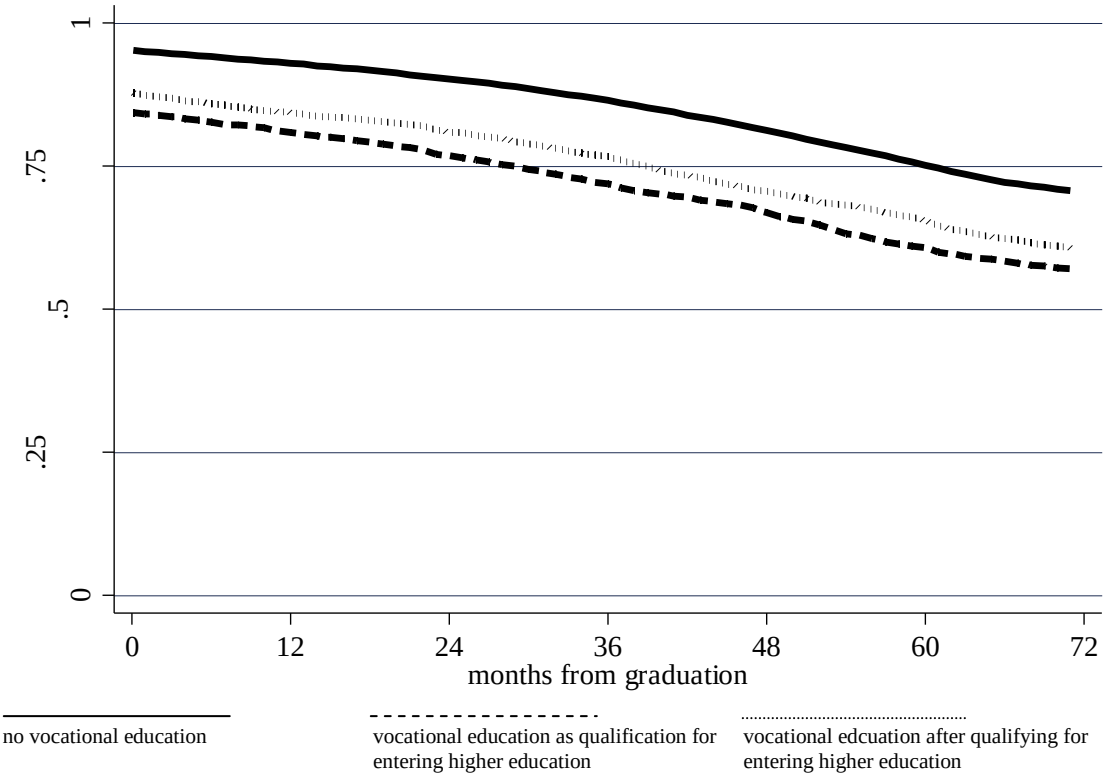
Furthermore, we can expect for all of the above mentioned hypotheses that especially those young adults are affected who have found their job via contacts from training before higher education. In combination with over-qualification, this variable can serve as a more direct indicator, whether the safety net was used (Hypothesis 6).

Beyond employer behavior, the returns to education could be affected in several ways in different stages of the career process through higher education until the establishment in the labor market. The first group of mechanisms works on the entry and during higher education. If those with a vocational degree have gained information which is useful for choosing a study program or helps acquiring skills

inside the higher education system, the experience in vocational training can lead to a premium (Oettinger, 1993). For example, apprentices may discover their potential to work in certain areas or get information from companies about beneficial fields or study programs (cf. Hypothesis 1).

From a life course perspective, it should also be considered that a delay of higher education is inevitably related to an increase in age. This effect can be expected to be especially strong in the German case too. As German young adults enter by international comparison late, especially for women the probability that family formation will conflict with their studies and the sensitive early career phase increases with age. This does not necessarily lead to a disadvantage in the career. Men have the opportunity to delay marriage and childbearing: Women have at least the option to give up family formation and focus on their career instead. However, the empirically higher number of graduates who are married or have children among those with prior vocational training shows that not everybody does this (see figure 5.3.1 and table 5.3.1). Therefore, an impairment of the working career can be expected. For an earlier cohort from the German state of Northrhine-Westphalia, it could be shown that this family formation disadvantage is largest among women (Meulemann, 1990).

Figure 5.3.1: Transitions into parenthood among female graduates during the first six years after graduation by educational career pattern.



In consequence, penalties in the labor market for double qualifications can be expected to be higher for women. On the other hand, these disadvantages of double qualifiers should be explained when the family status, i.e. relationship status and the presence of children, is included in the models (Hypothesis 7).

5.3.1 Data and Methods

For the purpose of this study, I consider a different dataset than the one used for the German case in the previous chapters. Since the GLHS does not have a sufficient number of graduates from higher education, an alternative data source focusing on this specific target group is needed. The graduate surveys of the HIS (Hochschul-Informations-System) qualify very well for this purpose (see chapter 1.5.6). Several cohorts of graduates from higher education in Germany are surveyed six months after graduation and in a second panel wave five years thereafter. However, only two cohorts are available as scientific use file; the graduates from 1997 (Fabian, 2006;

Fabian and Minks, 2006) and 2001 (Schramm and Beck, 2010) which are pooled for my analyses. The usable sample consists of 8,105 graduates.

For the analyses of the labor market entry, a large set of criteria is available in the dataset. Representing different relevant dimensions of the school to work transitions, I chose the log hourly wage five years after graduation; the international socio economic index score (Ganzeboom and Treiman, 1996) five years after graduation; the search time until the first 'significant' job, and whether the graduate was employed in an over-qualified job five years after graduation. Over-qualification is operationalized in two different ways: first, the question whether a degree from higher education is needed/expected for their job and second, if a salariat class position according to the ESeC-scheme (Rose and Harrison, 2007) could be achieved. These class positions are appropriate for higher education graduates, since they are the only classes that typically require higher education as an entrance criterion. The different dependent variables require different regression techniques to model them adequately. For the ISEI and the log hourly wages, I estimate linear (OLS) models (reported are log hazard ratio coefficients). The search time is modeled as a Cox event history model and the over-qualification-models as binary logistic regressions.

Most of the hypotheses set out at the beginning of this chapter refer to employer behavior and the direct job search process, while processes within education are not discussed. In order to test hypotheses on the labor market entry, two groups of variables are potential colliders. First, those factors influencing the probability of having vocational training before higher education and correlating with success in the labor market. They are considered in order to solve the problem of conditional independence as in most observational studies. And second, those mechanisms that are triggered by the vocational degree but influence the subsequent educational career. This second block of mechanisms is important, since in an analyses that wants to explain the role of the vocational training as an attribute of graduates does not ask for the full causal effect of having a vocational training degree, but rather what the mechanisms at the labor market entry are that add up to – or counterbalance – the training effect.

Furthermore, I include information in the model which approximates the propensity of entering vocational training, social origin (parental occupational status

and education[43]), the grades and educational career of the upper secondary education are included in the model. This may be criticized as an imperfect set of controls, since e.g. a direct measure of cognitive ability or motivation is missing. However, it should be noted that a part of the 'pre-treatment' differences are kept constant by controlling the post-treatment educational career. For the time in higher education, a much better set of control variables is available. Not only the actual career pattern, i.e. whether the studies were interrupted or a change in the study program occurred, but also the sources of finance and the satisfaction with the study program can be kept constant. Further, the work experience during studies and – probably most important – the percentiles of the final GPA achieved within each field of study are included in the model. The source of finance and the satisfaction with the study program are both measured in a broad set of variables. For each possible source of finance, the respondent estimated the percentage this source contributed to the total cost of living expenses and higher education. The satisfaction with the study program is captured by an item battery of many items measuring several dimensions of the satisfaction with higher education. Table 5.3.7 in the Appendix documents these variables.

In order to reduce the number of variables to a smaller set of dimensions, a principal component factor analysis for both sets of variables was carried out and only factors with an eigenvalue >1 are included in the regression. For the item-battery measuring financial resources, six factors and for the item-battery measuring satisfaction, four factors were chosen by this criterion. Special attention is given to the family formation in the German context, since graduates are comparatively old. The family situation at the time of graduation is captured by the presence of children and the relationship status. The distribution of all model-variables is shown in table 5.3.1.

To deal with the item nonresponse problem, which is critical in a voluntary mail survey, I use multiple imputation. The imputations are performed via chained equations (Royston, 2005; Royston, 2004; Rubin, 1987) adding twenty observations per case with at least one missing value. Dependent variables were not imputed, but all independent variables using an even broader set of determinants for imputation. The fact that in about 1,000 cases at least one variable had to be imputed shows the necessity to deal with item nonresponse. And even after that, this problem remains

[43] Parental education is measured via the CASMIN-scheme. An overview on the full scheme can be found in table 5.3.12 in the appendix to this chapter.

one of the major disadvantages caused by the fact the dataset was collected as a self-reported mail survey.

Table 5.3.1: Descriptive overview: dependent and independent variables and their distribution.

independent variables	**mean (SD); percent**
sex = male	48.67%
graduate-cohort = 2001	49.89%
field of study	
arts, humanities and social sciences	16.73%
education and social work	6.91%
economics and business	13.07%
engineering and agriculture	34.60%
science	9.17%
life science	9.17%
law	5.76%
abitur grade: centered, lowes=worst to highest=best	-0.50 (6.42)
abitur: not from Gymnasium	10.34%
age: first enrolment	20.8 (2.22)
(age: first enrolment)²	not meaningful to report
CASMIN education: father	
1a no degree	0.65%
1c/2a Haupt- or Realschule, with vocational degree	40.32%
1b/2b Haupt- or Realschule, no voc. degree	1.51%
2c_gen Abitur/Fachhochschulreife, no voc. degree	0.41%
2c_voc Abitur/Fachhochschulreife, voc. postsec. degree	4.32%
3a Fachhochschule-degree	18.32%
3b University-degree	31.98%
CASMIN education: mother	
1a no degree	1.20%
1c/2a Haupt- or Realschule, with vocational degree	53.31%
1b/2b Haupt- or Realschule, no voc. degree	8.25%
2c_gen Abitur/Fachhochschulreife, no voc. degree	1.30%
2c_voc Abitur/Fachhochschulreife, voc. postsec. degree	6.08%
3a Fachhochschule-degree	7.13%
3b University-degree	19.65%
fathers occupational position	
self employed	21.02%
employee	46.08%
civil servant	20.91%
work contract	11.56%
never employed	0.43%
mothers occupational position	
self employed	9.89%
employee	62.50%
civil servant	9.74%
work contract	10.36%
never employed	7.52%
no. of semesters studied until graduation	11.57 (2.91)
federal state of upper secondary degree	
northern states	15.94%
North-Rhine/Westphalia	20.58%
Hesse/Rhine/Palatinate	13.88%
Baden-Württemberg	12.59%
Bavaria	13.61%
eastern Germany	15.74%
city states	5.48%
abroad	1.85%
studies without interruption of >=1 semester	71.07%
changed field of study or program	18.07%
source of finance: 6 factors (PCA)	not meaningful to report
satisfaction with study program: 4 factors (PCA)	not meaningful to report, variables documented in table 5.3.7

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--- table 5.3.1 continued

work experience during studies (not mut. excl.)	
worked during studies to make ones living	21.29%
worked as student assistant	37.29%
worked in field related job: private sector	35.69%
self-employed: field related job	14.04%
not employed during studies	39.01%
percentile of GPA within field of study	not meaningful to report
children at time of first wave interview	11.51%
relationship status at time of first wave interview	
no partner	33.84%
relationship	50.04%
married	15.74%
vocational training before university	19.07%
vocational training before university: field overlapping	9.48%
vocational training before university: fields unrelated	9.59%
job search, voc. training and social ties	
no voc. training, job not found through network	79.49%
voc. training, job not found through network	17.02%
no voc. training, job found through network	1.44%
voc. training, job found through network	2.05%
job search, over-qualification, voc. training and social ties	
no overlapping voc. training, job not found through netw.	88.14%
overlapping voc. training, job not found through netw.	8.38%
no overlapping voc. training, job found through netw.	2.38%
overlapping voc. training, job found through netw.	1.11%
dependent variables	
ISEI	66.96 (12.73)
hourly wage (note: for models log, here not log)	18.78 (8.06)
search time in months	10.01 (14.90)
over-qualified: self-report	19.46%
over-qualified: ESeC	13.57%
N	8105

Source: HIS higher education graduate panels 1999 and 2001.
Own calculations, not weighted, multiple imputation of missing values.

Since dependent variables were not imputed, the number of observations varies to some degree between the models. As no direct comparison of the effects is made, this should be acceptable. Harmonizing the sample sizes would mean dropping all those cases that never find a job, but for example in the event history analysis on the search time they are well handled and the main motivation to estimate a Cox-model (cf. section 3 and chapters 4.3 to 4.5).

5.3.2 Results

For each labor market outcome, I report a separate model. Different operationalizations for the work experience in vocational education are used. Table 5.3.2 shows for each treatment/outcome-combination the relevant coefficient

representing the impact of educational detours on the respective outcome. The full tables including coefficients of all control variables are documented in the Appendix (5.3.4) in table 5.3.6 to 5.3.11.

Interpretation of the coefficients differs between the different models. The logged earnings and the ISEI-models are linear (OLS) regression models; higher coefficients mean higher values of wage or ISEI respectively, and thus a better job. In the over-qualification models, the dependent variables are coded 1 for over-qualified graduates and 0 otherwise. Positive values indicate that the respective independent variable increases the risk of over-qualification on average (all else equal).

The first model reports on the differences – all else being equal – between graduates with and without a vocational degree. For none of the outcomes, a vocational degree does make much of a difference. None of the coefficients is statistically significant, and the effects are miniscule. For example, the hourly wage is only roughly one percent higher for those with a double qualification. Thus, the overall effect of a double qualification is negligible. A somewhat different picture is found for those vocational degrees that overlap in content with the higher education degree. Here, a small gain in wages is left after controlling for all other variables in the model. On all other outcomes, however, there is ceteris paribus no bonus for a double qualification. At about the same very small degree, those with a non-fitting vocational education are penalized. Even in the search time, there is no difference when keeping all else equal. In sum, the empirical analysis fails in separating hypotheses 1 and 2. A strong human capital effect appears to be absent, but neither is there a penalty. On average, the double qualifiers have similar job characteristics including a similar risk of over-qualification and also a similar search time, which contradicts hypothesis 3 and 4.

Table 5.3.2: Effects of vocational training degrees on the labor market entry among higher education graduates.

model: central independent variable	ln(WAGE): OLS-regression	ISEI: OLS-regression	over-qualification: self-defined (logit)	over-qualification: not in ESeC 1 or 2 (logit)	search time (cox)
vocational degree	0.01 (0.56)	-0.10 (-0.27)	0.06 (0.67)	0.06 (0.50)	0.04 (1.03)
vocational degree: overlapping field with higher education	0.05* (2.12)	0.71 (1.55)	0.08 (0.71)	-0.01 (-0.10)	0.01 (0.22)
vocational degree: non-overlapping field with higher education	-0.03 (-1.52)	-0.80 (-1.79)	0.01 (0.05)	0.08 (0.65)	0.04 (0.97)
job search, voc. training and social ties					
no voc. training, job not found through networks	Reference				
voc. training, job not found through networks	0.01 (0.38)	-0.02 (-0.04)	0.01 (0.13)	0.03 (0.30)	0.03 (0.82)
no voc. training, job found through networks	0.04 (0.85)	-0.06 (-0.06)	0.41 (1.72)	-0.10 (-0.35)	-0.02 (-0.26)
voc. training, job found through networks	0.05 (1.26)	-0.89 (-1.04)	0.56** (3.00)	0.21 (0.92)	0.10 (1.14)
job search, over-qualification, voc. training and social ties					
no overlapping voc. training, job not found through networks	Reference				
overlapping voc. training, job not found through networks	0.04* (2.00)	0.82 (1.72)	0.02 (0.21)	-0.11 (-0.82)	0.01 (0.20)
no overlapping voc. training, job found through networks	0.04 (1.13)	-0.37 (-0.49)	0.43* (2.39)	-0.24 (-1.05)	0.04 (0.48)
overlapping voc. training, job found through networks	0.07 (1.46)	-0.37 (-0.32)	0.66** (2.70)	0.61* (2.14)	0.03 (0.26)
N	8098	7819	8105	8105	8105

Source: HIS higher education graduate panels 1999 and 2001; own calculations, not weighted, multiple imputation of missing values.

The lowest two sets of models report the result of the interaction of training and social network search which test hypotheses 6. Here, the effects go into the theoretically expected direction: there is a penalty on the ISEI-score, in terms of an occupational closure mechanism certainly the first thing to expect, and a higher risk of over-education for those who found their job via contacts from a previous vocational training. This result is consistent for both overlapping and non-overlapping vocational degrees.

For a closer look on the role of family formation, it is firstly important to separate between men and women. There is not much reason to expect particularly high penalties for men if family formation is the mechanism behind them. Previous studies have shown that married men and women with children were disadvantaged in the job search process after graduation (e.g. Meulemann, 1991). In table 5.3.3 the results from table 5.3.2 are broken down by sex. Differences are small, in the sense that there are not many substantial effects at all. Most notably, men can realize a bonus in wages but loose in other aspects. For women, I find the typical pattern that is expected for a credentialist hiring regime: a penalty in income, especially for vocational programs without skill-overlap with higher education, but a reduced search time.

Table 5.3.3: Effects of vocational training degrees on the labor market entry among higher education graduates – separate analyses by sex.

	ln(WAGE)	**ISEI**	**over-qual.: self-defined**	**over-qual.: not in ESeC**	**search time**
men					
regression model	OLS	OLS	logit, 1 = over-qualified	logit, 1 = over-qualified	cox, log hazard ration
vocational degree	0.05* (2.20)	-0.81 (-1.53)	0.04 (0.26)	0.32 (1.85)	0.01 (0.17)
vocational degree: overlapping field with higher education	0.05 (1.93)	-0.24 (-0.39)	0.18 (1.19)	0.13 (0.67)	0.00 (0.02)
vocational degree: non-overlapping field with higher education	0.02 (0.67)	-1.00 (-1.51)	-0.18 (-1.00)	0.30 (1.50)	0.01 (0.19)
N	3938	3773	3940	3885	3940
women					
vocational degree	-0.02 (-0.88)	0.49 (0.84)	0.08 (0.62)	-0.16 (-1.05)	0.09 (1.60)
vocational degree: overlapping field with higher education	0.04 (1.16)	1.65* (2.39)	-0.07 (-0.47)	-0.17 (-0.93)	0.03 (0.49)
vocational degree: non-overlapping field with higher education	-0.05* (-1.98)	-0.75 (-1.23)	0.15 (1.06)	-0.05 (-0.32)	0.07 (1.25)
N	4160	4046	4165	4165	4165

Source: HIS higher education graduate panels 1999 and 2001.
Own calculations, not weighted, multiple imputation of missing values.

In order to adjust for this, I estimate another set of models including family status and whether the person had any children, both measured at the time of graduation (table 5.3.4). First, these models confirm for a larger set of variables the

results of Meulemann (1991): for men, relationships and marriages are correlated positively with a number of concepts that indicate a favorable labor market entry. Children do not make a difference. By comparison, for women being single is not correlated with better jobs, only with a shorter search time. Having children is linked to a problematic labor market entry: even though these women are faster integrated in the labor market, they are employed in substantially worse jobs as can be seen by the negative effects on wage and the ISEI-score. Even though the t-value is somewhat lower, the effect itself does not change. More importantly, while the effects of family formation exist, they do not explain the small effects of the double qualification. Therefore, hypothesis 7 – that in particular women with double qualification are worse off in the labor market because they are more often in a critical phase of family formation at the time of the labor market entry – is not supported. Given that the coefficients for the double qualification stay remarkably stable for all models, we have to assume that the two mechanisms are largely independent from each other.

Table 5.3.4: Effects of vocational training degrees on the labor market entry among higher education graduates – including family formation. MEN.

men: family variables	**ln(WAGE)**	**ISEI**	**Over-qualification: self-defined**	**Over-qual.: not in ESeC 1 or 2**	**search time**
regression model	OLS	OLS	Logit, 1 = over-qualified	Logit, 1 = over-qualified	cox, log hazard ration
vocational degree	0.05* (2.07)	-0.78 (-1.46)	0.05 (0.33)	0.31 (1.79)	-0.03 (-0.54)
relationship status					
no partner	Reference				
partnership	0.05*** (3.38)	0.83* (2.39)	-0.34*** (-3.30)	-0.38** (-3.07)	0.24*** (6.78)
married	0.09*** (3.70)	0.48 (0.87)	-0.12 (-0.76)	-0.34 (-1.66)	0.86*** (15.07)
children at time of graduation	-0.02 (-0.80)	0.09 (0.14)	0.21 (1.15)	-0.11 (-0.43)	2.18*** (29.15)
vocational degree: overlapping field with higher education	0.05 (1.91)	-0.18 (-0.29)	0.19 (1.22)	0.13 (0.67)	-0.08 (-1.29)
relationship status					
no partner	Reference				
partnership	0.05*** (3.39)	0.84* (2.41)	-0.34** (-3.28)	-0.39** (-3.09)	0.24*** (6.77)
married	0.09*** (3.72)	0.47 (0.86)	-0.12 (-0.76)	-0.33 (-1.64)	0.86*** (15.10)
children at time of graduation	-0.02 (-0.78)	0.10 (0.15)	0.22 (1.19)	-0.11 (-0.43)	2.18*** (29.19)
vocational degree: non-overlapping field with higher education	0.02 (0.52)	-1.02 (-1.52)	-0.17 (-0.94)	0.30 (1.44)	0.05 (0.73)
relationship status					
no partner	Reference				
partnership	0.05*** (3.35)	0.84* (2.41)	-0.34*** (-3.31)	-0.39** (-3.11)	0.24*** (6.80)
married	0.09*** (3.73)	0.48 (0.87)	-0.12 (-0.74)	-0.34 (-1.66)	0.85*** (15.02)
children at time of graduation	-0.02 (-0.83)	0.12 (0.18)	0.21 (1.17)	-0.11 (-0.46)	2.18*** (29.12)
N	3876	3712	3876	3821	3876

Source: HIS higher education graduate panels 1999 and 2001; own calculations, not weighted, multiple imputation of missing values.

Table 5.3.4: Effects of vocational training degrees on the labor market entry among higher education graduates – including family formation. WOMEN.

women: family variables	**ln(WAGE)**	**ISEI**	**Over-qualification: self-defined**	**Over-qual.: not in ESeC 1 or 2**	**search time**
regression model	OLS	OLS	Logit, 1 = over-qualified	Logit, 1 = over-qualified	cox, log hazard ration
vocational degree	-0.02 (-0.81)	0.56 (0.96)	0.07 (0.54)	-0.17 (-1.16)	0.05 (0.84)
relationship status					
no partner	Reference				
partnership	0.01 (0.75)	0.26 (0.67)	0.06 (0.61)	0.08 (0.72)	0.20*** (5.61)
married	-0.02 (-0.92)	-0.74 (-1.30)	0.14 (1.07)	0.21 (1.42)	0.74*** (13.79)
children at time of graduation	-0.08** (-2.82)	-1.91** (-2.86)	0.15 (1.00)	0.46** (2.90)	3.67*** (40.95)
vocational degree: overlapping field with higher education	0.03 (1.10)	1.64* (2.38)	-0.09 (-0.59)	-0.18 (-0.97)	0.05 (0.77)
relationship status					
no partner	Reference				
partnership	0.01 (0.70)	0.21 (0.56)	0.06 (0.65)	0.08 (0.77)	0.20*** (5.57)
married	-0.03 (-0.98)	-0.77 (-1.35)	0.15 (1.10)	0.21 (1.44)	0.74*** (13.78)
children at time of graduation	-0.08** (-2.83)	-1.89** (-2.82)	0.15 (1.00)	0.46** (2.86)	3.68*** (40.98)
vocational degree: non-overlapping field with higher education	-0.05 (-1.85)	-0.67 (-1.09)	0.15 (1.09)	-0.06 (-0.40)	0.01 (0.24)
relationship status					
no partner	Reference				
partnership	0.01 (0.68)	0.24 (0.62)	0.06 (0.66)	0.07 (0.70)	0.21*** (5.62)
married	-0.02 (-0.95)	-0.73 (-1.28)	0.15 (1.10)	0.20 (1.39)	0.74*** (13.80)
children at time of graduation	-0.08 **(-2.79)	-1.89** (-2.82)	0.15 (0.96)	0.46** (2.88)	3.67*** (40.93)
N	4129	4011	4129	4129	4129

Source: HIS higher education graduate panels 1999 and 2001; own calculations, not weighted, multiple imputation of missing values.

Finally, hypothesis 7 projected that an additional degree can be used as an alternative to higher education if the labor market entry is difficult. If this hypothesis – which is derived from credentialist assumptions – is true, the over-qualified

individuals should be better off with a vocational degree. Table 5.3.5 summarizes the coefficients having a vocational degree for wage and ISEI. Problematic is the low number of cases that limits the possibility to draw strong conclusions from this analysis. The general direction of the effect, however, points towards a confirmation of this hypothesis. On average, the wage level achieved by double qualifiers is higher. And even though they are over-qualified, they achieve a higher ISEI-score.

Table 5.3.5: Effects of a vocational degree on the labor market entry among overeducated graduates

	ln(WAGE)	**ISEI**
vocational degree	0.09 (0.92)	2.95 (1.38)
N	410	400

Source: HIS higher education graduate panels 1999 and 2001.
Own calculations, not weighted, multiple imputation of missing values.

5.3.3 Conclusion

The main conclusion is in short: effects of educational careers on the labor market entry are not very strong. When debating the contribution of the frequent practice of German youth to complete a double qualification to social inequality, this finding should mute some concerns about additional disadvantages through delayed educational careers. Besides the obvious opportunity costs, there seems to be no large labor market penalty for the detour on the way to a higher education degree. Findings from the literature suggested that those with a vocational degree have lower chances of completing higher education. This illustrates that the higher education degree plays an important role for success. Once it is achieved, not many differences are left – apart from a higher risk of drop-outs from higher education within this group (Meulemann, 1991).

Against the findings of no additional advantage of a vocational degree for graduates from higher education, the human capital mechanism of a linear increase of productivity with each additional year of education has to be seen skeptical. The only exception is the group of men who have completed an apprenticeship within the same field of studies as their higher education degree. Among them, there is a positive

effect of vocational training on wage. And even within this group, gains are small. Given that double-qualifiers are on average older, a small positive wage effect should already be expected from the seniority bonuses in the collective wage agreements between unions and employers in Germany: until recently, wages were often defined by age instead of tenure. Thus, only substantial and larger wage effects could be interpreted as the result of an increase in human capital. In defense of the human capital mechanism, several arguments could be put forward to reason that the human capital theory would never even expect positive effects. Human capital depreciation is one such reason: if an increase in human capital goes along with an increase in productivity only in the shorter run, i.e. the human capital gained is devaluated rapidly over time, a vocational education degree that is already five years old at the time of the labor market entry should not be considered relevant human capital. That human capital loses its value over time when it is not practiced, is a common explanation e.g. for the scarring effect of unemployment (Gangl, 2004). Depreciation cannot explain negative effects, but non-effects. Similarly, critics of my interpretation in favor of the signaling or credentialism approaches could highlight the specificity of human capital to jobs. Skills can be field specific – and if the field of study differs between vocational training and higher education, the realized gains in human capital cannot pay off in the labor market. This is – however – unlikely. No logically persistent hypothesis can be derived from the human capital model on the question whether the same field of study should be better to increase returns – or the combination of different fields has higher payoffs. Is it simply more education in one field on several levels that improves productivity, or the broader knowledge from a combination of different fields? Many examples from the real world can be named as illustrations for the one or the other. Human capital specificity has been addressed by theorists from its beginning as job specific and unspecific human capital. To derive a hypothesis on the value of overlapping or complementary contents, it would be necessary to know what is more important for the majority of jobs: many skills in one field, or a specific combination of skills from different fields. Such softer forms of the human capital perspective – with only small changes – are open to a non-effect of a vocational degree achieved before a higher education degree, but only with additional information about the skill profiles jobs might require. My findings are therefore not as strongly in favor of the signaling or credentialism approach as if they would reveal

negative coefficients. As most coefficients are very small or zero, softer versions of the human capital model offer an easy escape.

Above, I postulated a number of empirical implications for the safety net hypotheses. According to this claim, vocational training serves as a fallback-option in case that either the completion of higher education or the search for a job in a higher class position fails. If this holds true, we should observe advantages in the labor market for those who have a vocational degree, since a second 'entry ticket' into the labor market can be used if the higher education degree does not grant access. This must go along with a higher risk of over-education for the double-qualifiers, since the faster entry can only be realized on the cost of accepting a job below the usual status-level of higher education graduates. This pattern would have been further support for the signaling or credentialism perspective, but could not be supported empirically.

Somewhat more confidence into the occupational closure- or credentialism-arguments can be gained from the result that the interaction of training and social network search exists. The analyses have revealed a penalty on the ISEI-score for those finding their job via social networks from vocational education. Furthermore, these graduates more often work in positions for which they are over-educated. This result is consistent for both overlapping and non-overlapping vocational degrees, what is another interesting hint that at least not only the human capital mechanism can explain the labor market pay-offs. Since the differentiation by the measured skill-overlap does not alter the results, I infer that skills and returns to education are at least to some degree independent from each other. There are, however, no positive effects on the search time.

When confronted with the non-significant and small coefficients in the first models, one may argue that isolating the safety net mechanism must fail. This mechanism affects only the small minority with actual labor market entry problems, whose contribution to the average outcome could be diluted among the large number of labor market entrants. Only a very small minority of students with a longer search time is expected to change the overall average difference between double-qualifiers and all other graduates. This problem is overcome by the analysis referring to hypothesis 5 and showing that among the over-educated graduates, those with a double qualification do indeed achieve higher wages. Apart from limitations stemming from the limited number of cases, this shows that on the labor market below the higher education segment, a very low income can be avoided by a

vocational degree. This is exactly the storyline one would expect from credentialism: if graduates do not succeed in entering the highly educated labor market segment, then a license to enter a job in the form of a degree can grant access to favorable jobs within the lower segments.

Finally breaking down the analyses by sex and controlling for the state of family formation does not alter the results much. Men are somewhat more likely to receive bonus from a vocational training; women are somewhat more likely to receive a penalty. The importance of family formation variables is, however, confirmed by the effects of childbearing on a successful labor market entry which occur only for women.

By comparison to men, women are affected in some aspects affected differently by double qualifications in their labor market entry. The independence from being without a partner does not result in a better job, but leads to a shorter search time. Most strongly, women other than men do have a disadvantage from parenthood. Surprisingly, this does not mirror in a longer search time, but rather in substantially worse jobs. As family formation is not the central concern of this chapter, scrutinizing these findings carefully has to be left for future research.

The expectation that labor market penalties from double qualifications among women can be explained by family formation does not find support in the empirical results either. Controlling for the factual family formation does not alter the negative coefficient of a vocational training. Even though some of the coefficients are not statistical significant, this pattern points towards another implication of the credentialist perspective: perhaps, women are more often in the situation that they have to rely on the safety net of a previous vocational degree due to their stronger limitations by family formation.

More importantly, including the family formation into the model does not explain the effects of the double qualification, neither for men nor for women. This pattern would be expected if women have penalties for double qualifications due to stronger involvement into family formation upon graduation after the long detour via an additional educational degree (Hypothesis 7). Even though the general disadvantage for women with children are found, the life course perspective does not contribute much to explain labor market entry patterns.

Taken together, the case of the double-qualifier in the German education system serves as a good testing ground for various theoretical hypotheses. Overall,

there is evidence that the human capital mechanism cannot explain returns to education exclusively. Other mechanisms, such as occupational closure by degrees as suggest by credentialism. What is more important from a policy perspective and for the broader context of inequality research is that the overall effects are small. Similarly as in the US, the German labor market does not ask ‘when’ education is achieved, it matters ‘what’ (type of) education is achieved.

5.3.4 Appendix

Table 5.3.6: Full model, Effects of vocational training degrees on the search time till the first significant job (Cox-model).

search time	vocational training before university		voc. training: field overlap		voc. training: no field overlap		job search: voc. training and netw.		job search: over-qualification, voc. training and netw.	
sex = male	-0.04	(-1.43)	-0.04	(-1.65)	-0.04	(-1.52)	-0.04	(-1.44)	-0.04	(-1.64)
graduate-cohort = 2001	-0.12	(-3.05)	-0.12	(-3.06)	-0.12	(-3.04)	-0.12	(-3.04)	-0.12	(-3.05)
field of study										
arts, hum., soc. sc.	ref.cat.									
educ. / soc. work	0.14	(2.71)	0.14	(2.63)	0.14	(2.69)	0.14	(2.72)	0.14	(2.64)
econ. / business	-0.06	(-1.39)	-0.06	(-1.26)	-0.05	(-1.11)	-0.06	(-1.40)	-0.06	(-1.24)
engin. / agric.	0.01	(0.45)	0.02	(0.46)	0.02	(0.58)	0.02	(0.47)	0.02	(0.48)
science	-0.01	(-0.23)	-0.01	(-0.23)	-0.01	(-0.19)	-0.01	(-0.22)	-0.01	(-0.22)
life science	0.13	(2.50)	0.13	(2.51)	0.13	(2.55)	0.13	(2.52)	0.13	(2.51)
law	-0.05	(-0.86)	-0.05	(-0.84)	-0.05	(-0.85)	-0.05	(-0.85)	-0.05	(-0.83)
abitur grade	0.00	(0.50)	0.001	(0.57)	0.001	(0.53)	0.001	(0.51)	0.001	(0.56)
abitur: non-gymn.	0.02	(0.51)	0.02	(0.50)	0.02	(0.52)	0.02	(0.53)	0.02	(0.52)
age first enr.	-0.05	(-5.20)	-0.05	(-6.50)	-0.05	(-6.00)	-0.05	(-5.21)	-0.05	(-6.45)
(age first enr.)²	-0.001	(-1.16)	-0.001	(-1.52)	-0.001	(-1.33)	-0.001	(-1.16)	-0.001	(-1.49)
father ed.: CASMIN										
1a	-0.05	(-0.33)	-0.05	(-0.36)	-0.05	(-0.32)	-0.05	(-0.34)	-0.05	(-0.35)
1c/2a with voc.	ref.cat.									
1b/2b no voc.	-0.07	(-0.76)	-0.07	(-0.75)	-0.07	(-0.74)	-0.07	(-0.76)	-0.07	(-0.75)
2c_gen	0.07	(0.39)	0.07	(0.37)	0.07	(0.37)	0.07	(0.40)	0.07	(0.38)
2c_voc	0.05	(0.84)	0.05	(0.83)	0.05	(0.82)	0.05	(0.85)	0.05	(0.85)
3a FH-degree	0.04	(1.19)	0.04	(1.16)	0.04	(1.15)	0.04	(1.19)	0.04	(1.16)
3b Uni-degree	0.02	(0.58)	0.02	(0.55)	0.02	(0.55)	0.02	(0.60)	0.02	(0.56)
mother ed.: CASMIN										
1a	-0.13	(-1.10)	-0.13	(-1.11)	-0.13	(-1.14)	-0.13	(-1.12)	-0.13	(-1.11)
1c/2a with voc.	ref.cat.									
1b/2b no voc.	-0.03	(-0.61)	-0.03	(-0.59)	-0.03	(-0.62)	-0.03	(-0.63)	-0.03	(-0.61)
2c_gen	0.08	(0.80)	0.08	(0.80)	0.08	(0.81)	0.08	(0.81)	0.08	(0.80)
2c_voc	0.02	(0.42)	0.02	(0.43)	0.02	(0.42)	0.02	(0.41)	0.02	(0.44)
3a FH-degree	-0.001	(-0.02)	-0.001	(-0.02)	-0.001	(-0.03)	-0.001	(-0.03)	-0.00	(-0.01)
3b Uni-degree	0.06	(1.56)	0.06	(1.55)	0.06	(1.55)	0.06	(1.55)	0.06	(1.56)
father occ. position										
self-employed	ref.cat.									
employee	-0.03	(-1.13)	-0.03	(-1.13)	-0.03	(-1.12)	-0.04	(-1.14)	-0.03	(-1.13)
civil servant	-0.04	(-1.00)	-0.04	(-0.99)	-0.04	(-0.97)	-0.04	(-1.00)	-0.04	(-0.99)
work contract	-0.02	(-0.44)	-0.02	(-0.45)	-0.02	(-0.43)	-0.02	(-0.42)	-0.02	(-0.44)
never employed	-0.09	(-0.51)	-0.09	(-0.51)	-0.08	(-0.49)	-0.09	(-0.51)	-0.09	(-0.52)
mother occ. position										
self-employed	ref.cat.									
employee	-0.003	(-0.07)	-0.002	(-0.06)	-0.002	(-0.06)	-0.003	(-0.06)	-0.002	(-0.06)
civil servant	-0.04	(-0.64)	-0.03	(-0.63)	-0.03	(-0.62)	-0.04	(-0.64)	-0.03	(-0.62)
work contract	-0.03	(-0.54)	-0.03	(-0.54)	-0.03	(-0.53)	-0.03	(-0.53)	-0.03	(-0.54)
never employed	0.08	(1.35)	0.08	(1.37)	0.08	(1.37)	0.08	(1.35)	0.08	(1.38)

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--- table 5.3.6 continued ---

no. of semesters	0.02	(3.66)	0.02	(3.58)	0.02	(3.62)	0.02	(3.67)	0.02	(3.58)
federal state degree										
northern states	ref.cat.									
NRW	-0.03	(-0.75)	-0.03	(-0.73)	-0.03	(-0.76)	-0.03	(-0.74)	-0.03	(-0.72)
Hessen/RLP	-0.01	(-0.14)	-0.01	(-0.13)	-0.01	(-0.16)	-0.01	(-0.14)	-0.01	(-0.14)
Baden-Württ.	-0.01	(-0.24)	-0.01	(-0.26)	-0.01	(-0.29)	-0.01	(-0.22)	-0.01	(-0.25)
Bavaria	0.01	(0.14)	0.004	(0.10)	0.004	(0.10)	0.01	(0.15)	0.004	(0.10)
east Germany	0.17	(3.74)	0.17	(3.78)	0.17	(3.72)	0.17	(3.76)	0.17	(3.77)
city states	0.10	(1.79)	0.10	(1.80)	0.10	(1.78)	0.10	(1.79)	0.10	(1.80)
abroad	0.14	(1.53)	0.13	(1.47)	0.13	(1.48)	0.14	(1.54)	0.13	(1.47)
no stud. interrupt.	-0.07	(-2.79)	-0.07	(-2.78)	-0.07	(-2.80)	-0.07	(-2.80)	-0.07	(-2.78)
changed study field	0.03	(1.03)	0.03	(1.04)	0.03	(1.02)	0.03	(1.05)	0.03	(1.04)
source of finance										
factor 1	-0.04	(-2.87)	-0.04	(-2.90)	-0.04	(-2.89)	-0.04	(-2.86)	-0.04	(-2.87)
factor 2	0.003	(0.20)	0.002	(0.17)	0.002	(0.17)	0.003	(0.23)	0.003	(0.19)
factor 3	0.02	(1.27)	0.02	(1.27)	0.02	(1.26)	0.02	(1.27)	0.02	(1.28)
factor 4	0.001	(0.12)	0.001	(0.12)	0.001	(0.14)	0.001	(0.09)	0.001	(0.12)
factor 5	-0.004	(-0.35)	-0.004	(-0.34)	-0.004	(-0.33)	-0.004	(-0.33)	-0.004	(-0.35)
factor 6	-0.03	(-1.95)	-0.03	(-1.94)	-0.03	(-1.95)	-0.03	(-1.98)	-0.03	(-1.95)
satisf. with study										
factor 1	0.01	(0.49)	0.01	(0.47)	0.01	(0.49)	0.01	(0.48)	0.01	(0.47)
factor 2	-0.001	(-0.06)	-0.001	(-0.06)	-0.001	(-0.06)	-0.001	(-0.05)	-0.001	(-0.05)
factor 3	0.01	(0.41)	0.01	(0.42)	0.01	(0.42)	0.01	(0.41)	0.01	(0.42)
factor 4	-0.01	(-0.39)	-0.01	(-0.37)	-0.01	(-0.39)	-0.01	(-0.38)	-0.01	(-0.37)
work experience during studies										
to make living	-0.01	(-0.33)	-0.01	(-0.33)	-0.01	(-0.32)	-0.01	(-0.31)	-0.01	(-0.32)
student assistant	-0.01	(-0.19)	-0.01	(-0.19)	-0.01	(-0.20)	-0.004	(-0.17)	-0.01	(-0.18)
private sector	0.003	(0.11)	0.004	(0.16)	0.004	(0.14)	0.003	(0.11)	0.004	(0.14)
self-employed	0.02	(0.58)	0.02	(0.59)	0.02	(0.58)	0.02	(0.61)	0.02	(0.58)
not employed	-0.04	(-1.23)	-0.04	(-1.24)	-0.04	(-1.27)	-0.04	(-1.22)	-0.04	(-1.24)
percentile of GPA	-0.02	(-0.35)	-0.01	(-0.32)	-0.02	(-0.35)	-0.02	(-0.34)	-0.01	(-0.32)
voc. before uni.	0.04	(1.03)								
voc. overlap			0.01	(0.22)						
voc. non-overlap					0.04	(0.97)				
job search: voc. and netw.										
no voc. + no netw.							ref.cat.			
voc. + no netw.							0.03	(0.82)		
no voc. + netw.							-0.02	(-0.26)		
voc. + netw.							0.10	(1.14)		
job search: overlap voc. and netw.										
no overlap+no netw.									ref.cat.	
overlap+no netw.									0.01	(0.20)
no overlap+netw.									0.04	(0.48)
overlap+netw.									0.03	(0.26)
N	8105		8105		8105		8105		8105	

Source: HIS higher education graduate panels 1999 and 2001; own calculations, not weighted, multiple imputation of missing values.

Table 5.3.7: Full models, hourly wages Effects of vocational training degrees on the wage (OLS-regression).

hourly wage	vocational training before university		voc. training: field overlap		voc. training: no field overlap		job search: voc. training and netw.		job search: over-qualification, voc. training and netw.	
sex = male	0.10	(9.05)	0.10	(9.24)	0.10	(8.70)	0.10	(9.05)	0.10	(9.27)
graduate-cohort = 2001	-0.05	(-2.96)	-0.05	(-2.99)	-0.05	(-3.02)	-0.05	(-2.92)	-0.05	(-2.95)
field of study										
arts, hum., soc. sc.	ref.cat.									
educ. / soc. work	0.02	(0.99)	0.02	(1.02)	0.02	(0.87)	0.02	(1.00)	0.02	(1.04)
econ. / business	0.30	(14.95)	0.29	(14.02)	0.30	(14.65)	0.30	(14.96)	0.29	(14.03)
engin. / agric.	0.22	(12.96)	0.22	(12.65)	0.22	(12.83)	0.22	(13.02)	0.22	(12.70)
science	0.16	(8.20)	0.16	(8.11)	0.16	(8.17)	0.16	(8.22)	0.16	(8.14)
life science	0.17	(7.53)	0.16	(7.40)	0.17	(7.49)	0.17	(7.52)	0.16	(7.39)
law	0.02	(0.81)	0.02	(0.78)	0.02	(0.83)	0.02	(0.83)	0.02	(0.81)
abitur grade	-0.003	(-3.35)	-0.003	(-3.44)	-0.003	(-3.25)	-0.003	(-3.34)	-0.003	(-3.45)
abitur: non-gymn.	-0.01	(-0.34)	-0.01	(-0.36)	-0.01	(-0.38)	-0.01	(-0.31)	-0.01	(-0.33)
age first enr.	0.004	(1.11)	0.01	(1.66)	0.001	(0.29)	0.01	(1.14)	0.01	(1.75)
(age first enr.)²	0.001	(1.81)	0.001	(2.11)	0.000	(1.39)	0.001	(1.84)	0.001	(2.17)
father ed.: CASMIN										
1a	-0.06	(-0.85)	-0.06	(-0.86)	-0.06	(-0.90)	-0.06	(-0.86)	-0.06	(-0.86)
1c/2a with voc.	ref.cat.									
1b/2b no voc.	0.05	(1.12)	0.04	(1.07)	0.05	(1.11)	0.05	(1.12)	0.04	(1.07)
2c_gen	0.11	(1.33)	0.11	(1.37)	0.11	(1.34)	0.11	(1.33)	0.11	(1.37)
2c_voc	0.006	(0.22)	0.01	(0.25)	0.01	(0.22)	0.01	(0.26)	0.01	(0.28)
3a FH-degree	-0.01	(-0.62)	-0.01	(-0.55)	-0.01	(-0.63)	-0.01	(-0.61)	-0.01	(-0.54)
3b Uni-degree	0.02	(0.94)	0.02	(1.00)	0.01	(0.91)	0.02	(0.96)	0.02	(1.01)
mother ed.: CASMIN										
1a	-0.06	(-1.16)	-0.06	(-1.10)	-0.06	(-1.13)	-0.06	(-1.14)	-0.06	(-1.09)
1c/2a with voc.	ref.cat.									
1b/2b no voc.	-0.02	(-1.11)	-0.02	(-1.07)	-0.02	(-1.05)	-0.02	(-1.12)	-0.02	(-1.08)
2c_gen	-0.03	(-0.73)	-0.03	(-0.74)	-0.03	(-0.78)	-0.03	(-0.73)	-0.03	(-0.74)
2c_voc	-0.02	(-1.07)	-0.02	(-1.07)	-0.02	(-1.07)	-0.02	(-1.06)	-0.02	(-1.05)
3a FH-degree	-0.04	(-1.97)	-0.04	(-1.95)	-0.04	(-1.96)	-0.04	(-1.95)	-0.04	(-1.93)
3b Uni-degree	-0.02	(-0.84)	-0.02	(-0.85)	-0.02	(-0.87)	-0.01	(-0.82)	-0.01	(-0.82)
father occ. position										
self-employed	ref.cat.									
employee	0.003	(0.24)	0.003	(0.23)	0.003	(0.24)	0.003	(0.22)	0.003	(0.21)
civil servant	-0.03	(-1.58)	-0.03	(-1.64)	-0.03	(-1.58)	-0.03	(-1.59)	-0.03	(-1.65)
work contract	0.01	(0.47)	0.01	(0.44)	0.01	(0.46)	0.01	(0.48)	0.01	(0.45)
never employed	-0.03	(-0.34)	-0.03	(-0.36)	-0.03	(-0.36)	-0.03	(-0.34)	-0.03	(-0.36)
mother occ. position										
self-employed	ref.cat.									
employee	-0.004	(-0.23)	-0.01	(-0.27)	-0.004	(-0.23)	-0.004	(-0.21)	-0.01	(-0.25)
civil servant	-0.01	(-0.20)	-0.01	(-0.24)	-0.01	(-0.19)	-0.01	(-0.19)	-0.01	(-0.23)
work contract	0.01	(0.39)	0.01	(0.36)	0.01	(0.37)	0.01	(0.41)	0.01	(0.37)
never employed	0.02	(0.86)	0.02	(0.79)	0.02	(0.87)	0.02	(0.88)	0.02	(0.82)
no. of semesters	-0.01	(-4.93)	-0.01	(-4.88)	-0.01	(-5.11)	-0.01	(-4.93)	-0.01	(-4.87)

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--- table 5.3.7 continued

federal state degree										
northern states										
NRW	0.01	(0.75)	0.01	(0.79)	0.01	(0.80)	0.01	(0.78)	0.01	(0.80)
Hessen/RLP	0.01	(0.42)	0.01	(0.46)	0.01	(0.46)	0.01	(0.41)	0.01	(0.46)
Baden-Württ.	0.04	(1.86)	0.04	(1.97)	0.04	(1.86)	0.04	(1.88)	0.04	(1.99)
Bavaria	0.05	(2.99)	0.06	(3.07)	0.06	(2.96)	0.06	(2.99)	0.06	(3.07)
east Germany	-0.20	(-9.63)	-0.20	(-9.56)	-0.20	(-9.49)	-0.20	(-9.65)	-0.20	(-9.59)
city states	-0.05	(-2.19)	-0.06	(-2.15)	-0.06	(-2.17)	-0.06	(-2.20)	-0.06	(-2.16)
abroad	0.02	(0.41)	0.02	(0.47)	0.02	(0.38)	0.02	(0.40)	0.02	(0.46)
.. unkown	-0.18	(-2.10)	-0.18	(-2.09)	-0.17	(-2.05)	-0.18	(-2.09)	-0.18	(-2.08)
no stud. interrupt.	-0.02	(-2.03)	-0.02	(-2.02)	-0.02	(-2.05)	-0.02	(-2.04)	-0.02	(-2.03)
changed study field	-0.02	(-1.21)	-0.02	(-1.18)	-0.02	(-1.19)	-0.02	(-1.20)	-0.02	(-1.18)
source of finance										
factor 1	-0.002	(-0.24)	-0.002	(-0.23)	-0.002	(-0.29)	-0.001	(-0.18)	-0.001	(-0.17)
factor 2	-0.04	(-6.06)	-0.04	(-6.04)	-0.04	(-6.14)	-0.04	(-5.98)	-0.04	(-5.96)
factor 3	0.004	(0.72)	0.004	(0.73)	0.004	(0.72)	0.004	(0.72)	0.004	(0.73)
factor 4	-0.01	(-1.38)	-0.01	(-1.41)	-0.01	(-1.38)	-0.01	(-1.40)	-0.01	(-1.42)
factor 5	-0.003	(-0.53)	-0.003	(-0.55)	-0.003	(-0.53)	-0.003	(-0.55)	-0.003	(-0.57)
factor 6	0.01	(0.97)	0.01	(0.98)	0.01	(0.98)	0.01	(0.94)	0.01	(0.95)
satisf. with study										
factor 1	-0.01	(-1.05)	-0.01	(-1.05)	-0.01	(-1.08)	-0.01	(-1.05)	-0.01	(-1.04)
factor 2	-0.02	(-4.06)	-0.02	(-4.04)	-0.02	(-4.05)	-0.02	(-4.05)	-0.02	(-4.03)
factor 3	-0.01	(-1.97)	-0.01	(-1.99)	-0.01	(-1.96)	-0.01	(-1.96)	-0.01	(-1.99)
factor 4	0.02	(2.96)	0.02	(2.97)	0.02	(2.96)	0.02	(2.97)	0.02	(2.97)
work experience during studies										
to make living	-0.02	(-1.46)	-0.02	(-1.47)	-0.02	(-1.44)	-0.02	(-1.43)	-0.02	(-1.45)
student assistant	0.01	(0.97)	0.01	(1.01)	0.01	(0.99)	0.01	(0.99)	0.01	(1.03)
private sector	0.02	(1.68)	0.02	(1.60)	0.02	(1.74)	0.02	(1.63)	0.02	(1.56)
self-employed	0.004	(0.28)	0.004	(0.28)	0.004	(0.28)	0.004	(0.29)	0.004	(0.28)
not employed	-0.01	(-0.96)	-0.01	(-0.89)	-0.01	(-0.95)	-0.01	(-0.92)	-0.01	(-0.85)
percentile of GPA	0.01	(0.53)	0.01	(0.52)	0.01	(0.60)	0.01	(0.54)	0.01	(0.52)
voc. before uni.	0.01	(0.56)								
voc. overlap			0.05	(2.12)						
voc. non-overlap					-0.03	(-1.52)				
job search: voc. and netw.										
no voc. + no netw.							ref.cat.			
voc. + no netw.							0.01	(0.38)		
no voc. + netw.							0.04	(0.85)		
voc. + netw.							0.05	(1.26)		
job search: overlap voc. and netw.										
no overlap+no netw.									ref.cat.	
overlap+no netw.									0.04	(2.00)
no overlap+netw.									0.04	(1.13)
overlap+netw.									0.07	(1.46)
constant	2.82	(64.46)	2.82	(65.76)	2.83	(66.38)	2.82	(64.32)	2.81	(65.52)
N	8098		8098		8098		8098		8098	

Source: HIS higher education graduate panels 1999 and 2001; own calculations, not weighted, multiple imputation of missing values.

Table 5.3.8: Full models, Effects of vocational training degrees on the ISEI-score (OLS-regression).

ISEI	vocational training before university		voc. training: field overlap		voc. training: no field overlap		job search: voc. training and netw.		job search: over-qualification, voc. training and netw.	
sex = male	0.87	(3.39)	0.93	(3.67)	0.82	(3.22)	0.87	(3.39)	0.93	(3.66)
graduate-cohort = 2001	-3.77	(-9.21)	-3.77	(-9.22)	-3.79	(-9.26)	-3.78	(-9.23)	-3.79	(-9.25)
field of study										
arts, hum., soc. sc.	ref.cat.									
educ. / soc. work	-5.17	(-9.60)	-5.13	(-9.55)	-5.21	(-9.69)	-5.18	(-9.61)	-5.13	(-9.55)
econ. / business	2.46	(5.41)	2.24	(4.75)	2.34	(5.15)	2.46	(5.40)	2.23	(4.75)
engin. / agric.	6.82	(17.79)	6.74	(17.45)	6.77	(17.62)	6.81	(17.74)	6.73	(17.39)
science	7.69	(17.22)	7.66	(17.13)	7.67	(17.17)	7.69	(17.20)	7.66	(17.12)
life science	23.21	(44.80)	23.15	(44.62)	23.18	(44.75)	23.20	(44.77)	23.15	(44.61)
law	18.57	(30.92)	18.55	(30.90)	18.57	(30.94)	18.56	(30.90)	18.54	(30.88)
abitur grade	-0.07	(-3.01)	-0.07	(-3.11)	-0.06	(-2.97)	-0.07	(-3.03)	-0.07	(-3.12)
abitur: non-gymn.	-0.99	(-2.53)	-0.99	(-2.54)	-1.00	(-2.57)	-1.00	(-2.55)	-1.00	(-2.57)
age first enr.	0.19	(2.09)	0.25	(3.07)	0.15	(1.78)	0.19	(2.08)	0.24	(3.02)
(age first enr.)²	0.01	(1.21)	0.01	(1.61)	0.01	(0.99)	0.01	(1.20)	0.01	(1.59)
father ed.: CASMIN										
1a	-0.66	(-0.42)	-0.64	(-0.41)	-0.71	(-0.45)	-0.64	(-0.41)	-0.61	(-0.39)
1c/2a with voc.	ref.cat.									
1b/2b no voc.	-0.72	(-0.75)	-0.77	(-0.79)	-0.74	(-0.77)	-0.72	(-0.74)	-0.78	(-0.80)
2c_gen	1.85	(1.03)	1.92	(1.07)	1.89	(1.06)	1.83	(1.02)	1.91	(1.06)
2c_voc	-0.78	(-1.32)	-0.77	(-1.30)	-0.78	(-1.32)	-0.80	(-1.35)	-0.79	(-1.34)
3a FH-degree	-0.02	(-0.06)	-0.002	(-0.01)	-0.02	(-0.05)	-0.03	(-0.08)	-0.01	(-0.02)
3b Uni-degree	-0.04	(-0.10)	-0.02	(-0.05)	-0.04	(-0.12)	-0.05	(-0.14)	-0.03	(-0.07)
mother ed.: CASMIN										
1a	-1.08	(-0.93)	-1.03	(-0.88)	-1.05	(-0.89)	-1.09	(-0.93)	-1.05	(-0.90)
1c/2a with voc.	ref.cat.									
1b/2b no voc.	0.34	(0.75)	0.35	(0.76)	0.37	(0.81)	0.34	(0.75)	0.35	(0.77)
2c_gen	0.87	(0.83)	0.88	(0.85)	0.83	(0.80)	0.86	(0.82)	0.87	(0.84)
2c_voc	-0.55	(-1.10)	-0.55	(-1.09)	-0.55	(-1.09)	-0.55	(-1.09)	-0.54	(-1.08)
3a FH-degree	0.80	(1.69)	0.81	(1.70)	0.81	(1.70)	0.80	(1.68)	0.80	(1.69)
3b Uni-degree	0.80	(2.00)	0.80	(2.00)	0.79	(1.98)	0.80	(2.00)	0.80	(1.99)
father occ. position										
self-employed	ref.cat.									
employee	0.25	(0.81)	0.25	(0.80)	0.25	(0.81)	0.25	(0.82)	0.25	(0.81)
civil servant	0.53	(1.40)	0.51	(1.35)	0.52	(1.39)	0.53	(1.41)	0.51	(1.36)
work contract	0.92	(1.96)	0.91	(1.93)	0.91	(1.95)	0.91	(1.94)	0.90	(1.92)
never employed	3.01	(1.67)	2.99	(1.66)	2.98	(1.66)	3.00	(1.67)	2.98	(1.66)
mother occ. position										
self-employed	ref.cat.									
employee	0.16	(0.38)	0.14	(0.34)	0.15	(0.37)	0.15	(0.36)	0.13	(0.32)
civil servant	0.24	(0.43)	0.22	(0.39)	0.24	(0.42)	0.24	(0.42)	0.22	(0.38)
work contract	-0.09	(-0.17)	-0.11	(-0.19)	-0.11	(-0.20)	-0.10	(-0.18)	-0.11	(-0.20)
never employed	0.366	(0.62)	0.33	(0.55)	0.36	(0.60)	0.36	(0.61)	0.32	(0.55)
no. of semesters	-0.12	(-2.42)	-0.11	(-2.31)	-0.12	(-2.49)	-0.12	(-2.43)	-0.11	(-2.32)

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--- table 5.3.8 continued

federal state degree										
northern states	ref.cat.									
NRW	-0.69	(-1.80)	-0.68	(-1.78)	-0.67	(-1.75)	-0.70	(-1.81)	-0.70	(-1.80)
Hessen/RLP	-0.47	(-1.10)	-0.46	(-1.08)	-0.45	(-1.06)	-0.47	(-1.11)	-0.46	(-1.09)
Baden-Württ.	-0.18	(-0.41)	-0.13	(-0.30)	-0.16	(-0.37)	-0.19	(-0.43)	-0.14	(-0.33)
Bavaria	-0.99	(-2.31)	-0.96	(-2.23)	-0.99	(-2.31)	-0.99	(-2.31)	-0.96	(-2.24)
east Germany	-1.56	(-3.34)	-1.56	(-3.33)	-1.52	(-3.24)	-1.57	(-3.34)	-1.55	(-3.32)
city states	-1.64	(-2.90)	-1.63	(-2.87)	-1.62	(-2.87)	-1.64	(-2.89)	-1.62	(-2.85)
abroad	0.14	(0.15)	0.19	(0.21)	0.14	(0.15)	0.14	(0.15)	0.20	(0.21)
oa	-5.66	(-2.77)	-5.65	(-2.76)	-5.57	(-2.73)	-5.69	(-2.78)	-5.68	(-2.78)
no stud. interrupt.	-0.09	(-0.34)	-0.09	(-0.32)	-0.09	(-0.35)	-0.09	(-0.33)	-0.09	(-0.31)
changed study field	-0.45	(-1.44)	-0.44	(-1.41)	-0.44	(-1.41)	-0.45	(-1.44)	-0.44	(-1.42)
source of finance										
factor 1	-0.24	(-1.50)	-0.23	(-1.47)	-0.24	(-1.53)	-0.24	(-1.53)	-0.24	(-1.51)
factor 2	-0.290	(-2.18)	-0.28	(-2.13)	-0.30	(-2.21)	-0.30	(-2.23)	-0.29	(-2.19)
factor 3	0.14	(1.17)	0.15	(1.17)	0.15	(1.17)	0.15	(1.17)	0.15	(1.18)
factor 4	0.37	(3.34)	0.37	(3.32)	0.37	(3.33)	0.37	(3.36)	0.37	(3.34)
factor 5	-0.17	(-1.44)	-0.17	(-1.45)	-0.17	(-1.44)	-0.17	(-1.44)	-0.17	(-1.46)
factor 6	-0.35	(-2.24)	-0.35	(-2.24)	-0.35	(-2.23)	-0.35	(-2.22)	-0.35	(-2.24)
satisf. with study										
factor 1	-0.05	(-0.34)	-0.04	(-0.32)	-0.05	(-0.36)	-0.05	(-0.33)	-0.04	(-0.31)
factor 2	-0.18	(-1.42)	-0.18	(-1.41)	-0.18	(-1.40)	-0.18	(-1.42)	-0.18	(-1.42)
factor 3	0.12	(0.94)	0.12	(0.93)	0.12	(0.94)	0.12	(0.94)	0.13	(0.93)
factor 4	0.04	(0.31)	0.04	(0.31)	0.04	(0.32)	0.04	(0.30)	0.04	(0.30)
work experience during studies										
to make living	-0.84	(-2.68)	-0.85	(-2.70)	-0.84	(-2.68)	-0.85	(-2.71)	-0.85	(-2.71)
student assistant	1.28	(4.95)	1.29	(4.98)	1.29	(4.98)	1.27	(4.92)	1.28	(4.96)
private sector	0.44	(1.65)	0.42	(1.56)	0.45	(1.66)	0.45	(1.67)	0.43	(1.61)
self-employed	-0.88	(-2.52)	-0.89	(-2.53)	-0.88	(-2.52)	-0.89	(-2.55)	-0.89	(-2.55)
not employed	0.25	(0.85)	0.27	(0.91)	0.26	(0.89)	0.24	(0.82)	0.26	(0.88)
percentile of GPA	1.30	(2.96)	1.28	(2.92)	1.31	(2.99)	1.29	(2.95)	1.28	(2.91)
voc. before uni.	-0.10	(-0.27)								
voc. overlap			0.71	(1.55)						
voc. non-overlap					-0.80	(-1.79)				
job search: voc. and netw.										
no voc. + no netw.							ref.cat.			
voc. + no netw.							-0.02	(-0.04)		
no voc. + netw.							-0.06	(-0.06)		
voc. + netw.							-0.89	(-1.04)		
job search: overlap voc. and netw.										
no overlap+no netw.									ref.cat.	
overlap+no netw.									0.82	(1.72)
no overlap+netw.									-0.37	(-0.49)
overlap+netw.									-0.37	(-0.32)
constant	62.22	(64.73)	62.06	(65.43)	62.40	(65.43)	62.26	(64.69)	62.11	(65.35)
N	7819		7819		7819		7819		7819	

Source: HIS higher education graduate panels 1999 and 2001; own calculations, not weighted, multiple imputation of missing values.

Table 5.3.9: Full models, Effects of a vocational degree on the labor market entry among overeducated graduates (over-qualification: self-defined; logit).

over-qualification: self-report	vocational training before university		voc. training: field overlap		voc. training: no field overlap		job search: voc. training and netw.		job search: over-qualification, voc. training and netw.	
sex = male	-0.37	(-5.37)	-0.37	(-5.55)	-0.37	(-5.55)	-0.37	(-5.38)	-0.37	(-5.49)
graduate-cohort = 2001	-0.07	(-0.72)	-0.08	(-0.74)	-0.07	(-0.73)	-0.07	(-0.63)	-0.06	(-0.62)
field of study										
arts, hum., soc. sc.	ref.cat.									
educ. / soc. work	-0.02	(-0.13)	-0.02	(-0.17)	-0.02	(-0.19)	-0.01	(-0.10)	-0.02	(-0.12)
econ. / business	0.10	(0.94)	0.08	(0.78)	0.11	(1.04)	0.11	(1.01)	0.09	(0.87)
engin. / agric.	-0.44	(-4.73)	-0.45	(-4.75)	-0.44	(-4.68)	-0.43	(-4.57)	-0.43	(-4.58)
science	-0.56	(-4.88)	-0.58	(-4.89)	-0.58	(-4.87)	-0.57	(-4.83)	-0.57	(-4.84)
life science	-3.57	(-9.74)	-3.58	(-9.75)	-3.57	(-9.73)	-3.58	(-9.74)	-3.58	(-9.75)
law	-1.03	(-5.67)	-1.03	(-5.67)	-1.03	(-5.67)	-1.02	(-5.62)	-1.02	(-5.63)
abitur grade	0.03	(5.37)	0.03	(5.39)	0.03	(5.42)	0.03	(5.39)	0.03	(5.39)
abitur: non-gymn.	-0.10	(-0.97)	-0.10	(-0.99)	-0.10	(-0.98)	-0.09	(-0.89)	-0.09	(-0.89)
age first enr.	-0.08	(-3.51)	-0.08	(-4.22)	-0.09	(-4.31)	-0.08	(-3.44)	-0.08	(-3.97)
(age first enr.)²	-0.001	(-0.95)	-0.002	(-1.10)	-0.002	(-1.22)	-0.001	(-0.87)	-0.001	(-0.93)
father ed.: CASMIN										
1a	0.71	(2.02)	0.70	(2.00)	0.70	(2.01)	0.70	(1.99)	0.69	(1.97)
1c/2a with voc.	ref.cat.									
1b/2b no voc.	0.36	(1.61)	0.36	(1.60)	0.37	(1.63)	0.36	(1.59)	0.36	(1.60)
2c_gen	-0.44	(-0.79)	-0.43	(-0.77)	-0.44	(-0.79)	-0.43	(-0.77)	-0.43	(-0.77)
2c_voc	0.32	(2.30)	0.32	(2.31)	0.32	(2.30)	0.33	(2.39)	0.34	(2.41)
3a FH-degree	-0.002	(-0.02)	-0.001	(-0.01)	-0.004	(-0.05)	-0.001	(-0.01)	-0.001	(-0.01)
3b Uni-degree	-0.12	(-1.32)	-0.12	(-1.32)	-0.13	(-1.35)	-0.12	(-1.27)	-0.12	(-1.27)
mother ed.: CASMIN										
1a	-0.36	(-1.25)	-0.36	(-1.23)	-0.37	(-1.26)	-0.36	(-1.23)	-0.35	(-1.21)
1c/2a with voc.	ref.cat.									
1b/2b no voc.	0.10	(0.92)	0.11	(0.95)	0.11	(0.94)	0.11	(0.93)	0.11	(0.93)
2c_gen	-0.30	(-1.03)	-0.08	(-1.04)	-0.31	(-1.04)	-0.29	(-0.98)	-0.29	(-0.98)
2c_voc	0.11	(0.84)	0.11	(0.83)	0.11	(0.83)	0.11	(0.85)	0.11	(0.83)
3a FH-degree	-0.24	(-1.82)	-0.24	(-1.82)	-0.25	(-1.82)	-0.24	(-1.78)	-0.24	(-1.77)
3b Uni-degree	-0.12	(-1.09)	-0.13	(-1.11)	-0.13	(-1.11)	-0.12	(-1.07)	-0.12	(-1.07)
father occ. position										
self-employed	ref.cat.									
employee	-0.19	(-2.33)	-0.19	(-2.32)	-0.19	(-2.32)	-0.19	(-2.39)	-0.19	(-2.39)
civil servant	-0.22	(-2.13)	-0.22	(-2.13)	-0.22	(-2.12)	-0.22	(-2.17)	-0.22	(-2.17)
work contract	-0.12	(-1.04)	-0.12	(-1.05)	-0.12	(-1.04)	-0.12	(-1.02)	-0.12	(-1.03)
never employed	-0.11	(-0.27)	-0.12	(-0.28)	-0.12	(-0.27)	-0.13	(-0.29)	-0.13	(-0.31)
mother occ. position										
self-employed	ref.cat.									
employee	-0.01	(-0.09)	-0.01	(-0.11)	-0.01	(-0.08)	-0.001	(-0.01)	-0.002	(-0.02)
civil servant	-0.00	(-0.00)	-0.00	(-0.00)	0.003	(0.02)	0.004	(0.02)	0.002	(0.01)
work contract	0.08	(0.57)	0.08	(0.55)	0.08	(0.57)	0.09	(0.62)	0.09	(0.61)
never employed	0.13	(0.88)	0.13	(0.86)	0.13	(0.90)	0.14	(0.93)	0.14	(0.90)
no. of semesters	0.04	(3.69)	0.04	(3.69)	0.04	(3.64)	0.04	(3.68)	0.04	(3.70)

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--- table 5.3.9 continued

federal state degree										
northern states	ref.cat.									
NRW	0.18	(1.77)	0.18	(1.79)	0.18	(1.77)	0.18	(1.83)	0.18	(1.85)
Hessen/RLP	0.06	(0.52)	0.06	(0.55)	0.06	(0.52)	0.06	(0.55)	0.06	(0.57)
Baden-Württ.	0.10	(0.86)	0.10	(0.88)	0.10	(0.83)	0.11	(0.94)	0.11	(0.97)
Bavaria	-0.04	(-0.32)	-0.04	(-0.31)	-0.04	(-0.36)	-0.04	(-0.31)	-0.03	(-0.29)
east Germany	0.43	(3.49)	0.43	(3.53)	0.43	(3.50)	0.43	(3.47)	0.423	(3.49)
city states	0.25	(1.72)	0.26	(1.73)	0.25	(1.71)	0.25	(1.69)	0.25	(1.69)
abroad	-0.04	(-0.16)	-0.04	(-0.17)	-0.05	(-0.21)	-0.04	(-0.17)	-0.04	(-0.17)
oa	0.56	(1.16)	0.57	(1.18)	0.56	(1.17)	0.56	(1.17)	0.56	(1.17)
no stud. interrupt.	0.07	(1.02)	0.07	(1.01)	0.07	(1.01)	0.07	(0.99)	0.07	(0.99)
changed study field	0.10	(1.29)	0.10	(1.30)	0.10	(1.29)	0.10	(1.29)	0.10	(1.31)
source of finance										
factor 1	0.03	(0.64)	0.03	(0.62)	0.03	(0.61)	0.03	(0.76)	0.03	(0.76)
factor 2	-0.03	(-0.88)	-0.03	(-0.90)	-0.03	(-0.91)	-0.02	(-0.67)	-0.02	(-0.67)
factor 3	-0.003	(-0.10)	-0.003	(-0.10)	-0.003	(-0.10)	-0.003	(-0.10)	-0.004	(-0.12)
factor 4	-0.10	(-2.45)	-0.10	(-2.45)	-0.10	(-2.44)	-0.11	(-2.52)	-0.11	(-2.54)
factor 5	-0.01	(-0.18)	-0.01	(-0.18)	-0.01	(-0.17)	-0.01	(-0.21)	-0.01	(-0.20)
factor 6	-0.003	(-0.07)	-0.003	(-0.06)	-0.003	(-0.07)	-0.01	(-0.16)	-0.01	(-0.14)
satisf. with study										
factor 1	0.001	(0.03)	0.001	(0.02)	0.001	(0.02)	0.002	(0.04)	0.001	(0.03)
factor 2	0.06	(1.70)	0.06	(1.71)	0.06	(1.70)	0.06	(1.72)	0.06	(1.72)
factor 3	0.04	(1.06)	0.04	(1.06)	0.04	(1.07)	0.04	(1.04)	0.04	(1.04)
factor 4	-0.02	(-0.63)	-0.02	(-0.62)	-0.02	(-0.62)	-0.02	(-0.60)	-0.02	(-0.60)
work experience during studies										
to make living	0.12	(1.50)	0.12	(1.50)	0.12	(1.51)	0.13	(1.62)	0.13	(1.60)
student assistant	-0.27	(-3.84)	-0.27	(-3.83)	-0.27	(-3.84)	-0.26	(-3.77)	-0.26	(-3.77)
private sector	-0.10	(-1.40)	-0.10	(-1.41)	-0.10	(-1.37)	-0.11	(-1.48)	-0.11	(-1.51)
self-employed	0.10	(1.16)	0.10	(1.15)	0.10	(1.16)	0.11	(1.22)	0.11	(1.22)
not employed	0.02	(0.22)	0.01	(0.23)	0.02	(0.21)	0.03	(0.33)	0.03	(0.34)
percentile of GPA	-0.93	(-7.90)	-0.93	(-7.89)	-0.93	(-7.88)	-0.93	(-7.89)	-0.93	(-7.90)
voc. before uni.	0.06	(0.67)								
voc. overlap			0.08	(0.71)						
voc. non-overlap					0.01	(0.05)				
job search: voc. and netw.										
no voc. + no netw.							ref.cat.			
voc. + no netw.							0.01	(0.13)		
no voc. + netw.							0.41	(1.72)		
voc. + netw.							0.56	(3.00)		
job search: overlap voc. and netw.										
no overlap+no netw.									ref.cat.	
overlap+no netw.									0.02	(0.21)
no overlap+netw.									0.43	(2.39)
overlap+netw.									0.66	(2.70)
constant	-0.80	(-3.34)	-0.79	(-3.32)	-0.78	(-3.25)	-0.84	(-3.49)	-0.84	(-3.52)
N	8105		8105		8105		8105		8105	

Source: HIS higher education graduate panels 1999 and 2001; own calculations, not weighted, multiple imputation of missing values.

Table 5.3.10: Full models, effects of a vocational degree on the labor market entry among overeducated graduates (over-qualification: not in ESEC 1 or 2; logit).

over-qualification: ESeC	vocational training before university		voc. training: field overlap		voc. training: no field overlap		job search: voc. training and netw.		job search: over-qualification, voc. training and netw.	
sex = male	-0.34	(-4.32)	-0.35	(-4.49)	-0.34	(-4.36)	-0.34	(-4.32)	-0.35	(-4.51)
graduate-cohort = 2001	0.65	(5.28)	0.65	(5.26)	0.65	(5.28)	0.65	(5.29)	0.67	(5.33)
field of study										
arts, hum., soc. sc.	ref.cat.									
educ. / soc. work	0.29	(2.35)	0.28	(2.31)	0.29	(2.36)	0.29	(2.35)	0.28	(2.27)
econ. / business	-0.16	(-1.43)	-0.15	(-1.27)	-0.15	(-1.26)	-0.16	(-1.43)	-0.16	(-1.31)
engin. / agric.	-1.12	(-10.3)	-1.12	(-10.2)	-1.11	(-10.3)	-1.12	(-10.3)	-1.12	(-10.2)
science	-1.12	(-7.82)	-1.12	(-7.81)	-1.12	(-7.81)	-1.12	(-7.82)	-1.12	(-7.83)
life science	-3.00	(-9.41)	-3.00	(-9.40)	-3.00	(-9.39)	-3.00	(-9.41)	-3.00	(-9.39)
law	-0.90	(-4.77)	-0.90	(-4.77)	-0.90	(-4.76)	-0.90	(-4.76)	-0.90	(-4.77)
abitur grade	0.03	(4.75)	0.03	(4.79)	0.03	(4.76)	0.03	(4.77)	0.03	(4.83)
abitur: non-gymn.	0.32	(3.06)	0.33	(3.05)	0.33	(3.07)	0.33	(3.07)	0.33	(3.09)
age first enr.	-0.03	(-1.05)	-0.04	(-1.58)	-0.03	(-1.22)	-0.03	(-1.05)	-0.04	(-1.66)
(age first enr.)²	-0.001	(-0.57)	-0.001	(-0.80)	-0.001	(-0.63)	-0.001	(-0.57)	-0.001	(-0.87)
father ed.: CASMIN										
1a	-0.08	(-0.17)	-0.08	(-0.17)	-0.07	(-0.15)	-0.09	(-0.18)	-0.12	(-0.25)
1c/2a with voc.	ref.cat.									
1b/2b no voc.	0.03	(0.09)	0.03	(0.11)	0.03	(0.11)	0.03	(0.08)	0.04	(0.12)
2c_gen	0.02	(0.04)	0.01	(0.02)	0.02	(0.03)	0.03	(0.04)	0.01	(0.02)
2c_voc	0.16	(1.00)	0.16	(0.99)	0.16	(0.98)	0.17	(1.00)	0.17	(1.02)
3a FH-degree	-0.07	(-0.67)	-0.07	(-0.69)	-0.07	(-0.69)	-0.07	(-0.65)	-0.07	(-0.69)
3b Uni-degree	0.05	(0.48)	0.05	(0.45)	0.05	(0.46)	0.05	(0.50)	0.05	(0.49)
mother ed.: CASMIN										
1a	-0.19	(-0.53)	-0.19	(-0.53)	-0.20	(-0.54)	-0.19	(-0.53)	-0.17	(-0.48)
1c/2a with voc.	ref.cat.									
1b/2b no voc.	-0.22	(-1.49)	-0.22	(-1.48)	-0.22	(-1.50)	-0.22	(-1.48)	-0.22	(-1.48)
2c_gen	0.07	(0.23)	0.07	(0.21)	0.07	(0.24)	0.07	(0.24)	0.08	(0.24)
2c_voc	0.09	(0.64)	0.09	(0.64)	0.09	(0.64)	0.09	(0.62)	0.08	(0.54)
3a FH-degree	-0.17	(-1.17)	-0.17	(-1.17)	-0.17	(-1.17)	-0.17	(-1.18)	-0.17	(-1.17)
3b Uni-degree	-0.23	(-1.82)	-0.23	(-1.84)	-0.23	(-1.81)	-0.23	(-1.82)	-0.23	(-1.84)
father occ. position										
self-employed	ref.cat.									
employee	-0.09	(-0.94)	-0.09	(-0.93)	-0.09	(-0.94)	-0.09	(-0.95)	-0.09	(-0.95)
civil servant	-0.18	(-1.49)	-0.17	(-1.48)	-0.17	(-1.48)	-0.18	(-1.51)	-0.18	(-1.51)
work contract	-0.27	(-1.94)	-0.27	(-1.94)	-0.27	(-1.94)	-0.27	(-1.93)	-0.27	(-1.95)
never employed	-0.24	(-0.43)	-0.24	(-0.43)	-0.24	(-0.42)	-0.24	(-0.42)	-0.25	(-0.45)
mother occ. position										
self-employed	ref.cat.									
employee	-0.09	(-0.77)	-0.09	(-0.76)	-0.09	(-0.75)	-0.09	(-0.74)	-0.09	(-0.71)
civil servant	-0.03	(-0.18)	-0.03	(-0.17)	-0.03	(-0.17)	-0.03	(-0.17)	-0.03	(-0.15)
work contract	-0.05	(-0.28)	-0.05	(-0.28)	-0.04	(-0.27)	-0.04	(-0.27)	-0.04	(-0.27)
never employed	-0.23	(-1.28)	-0.23	(-1.27)	-0.23	(-1.25)	-0.23	(-1.28)	-0.24	(-1.30)
no. of semesters	0.02	(1.34)	0.02	(1.28)	0.02	(1.32)	0.02	(1.34)	0.02	(1.31)

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--- table 5.3.10 continued

federal state degree										
northern states	ref.cat.									
NRW	0.13	(1.10)	0.13	(1.10)	0.13	(1.09)	0.13	(1.10)	0.13	(1.13)
Hessen/RLP	0.13	(1.00)	0.13	(1.00)	0.13	(0.99)	0.13	(1.00)	0.13	(1.01)
Baden-Württ.	0.17	(1.23)	0.16	(1.20)	0.16	(1.19)	0.17	(1.24)	0.17	(1.24)
Bavaria	0.08	(0.62)	0.08	(0.59)	0.08	(0.60)	0.08	(0.61)	0.08	(0.59)
east Germany	0.45	(3.27)	0.46	(3.29)	0.45	(3.24)	0.45	(3.27)	0.46	(3.29)
city states	0.40	(2.45)	0.40	(2.44)	0.40	(2.43)	0.40	(2.42)	0.39	(2.36)
abroad	-0.42	(-1.37)	-0.43	(-1.40)	-0.42	(-1.38)	-0.42	(-1.37)	-0.44	(-1.44)
oa	1.00	(1.84)	1.01	(1.85)	1.00	(1.82)	1.00	(1.83)	0.97	(1.77)
no stud. interrupt.	0.05	(0.58)	0.05	(0.57)	0.05	(0.58)	0.05	(0.58)	0.04	(0.54)
changed study field	0.16	(1.80)	0.16	(1.80)	0.16	(1.79)	0.16	(1.80)	0.17	(1.89)
source of finance										
factor 1	0.03	(0.55)	0.03	(0.53)	0.03	(0.56)	0.03	(0.55)	0.03	(0.54)
factor 2	0.02	(0.54)	0.02	(0.52)	0.02	(0.54)	0.02	(0.59)	0.02	(0.57)
factor 3	-0.01	(-0.13)	-0.01	(-0.13)	-0.02	(-0.14)	-0.01	(-0.13)	-0.01	(-0.17)
factor 4	-0.04	(-0.83)	-0.04	(-0.83)	-0.04	(-0.83)	-0.04	(-0.85)	-0.04	(-0.90)
factor 5	0.002	(0.04)	0.002	(0.05)	0.002	(0.05)	0.002	(0.06)	0.01	(0.13)
factor 6	-0.04	(-0.92)	-0.04	(-0.92)	-0.04	(-0.93)	-0.04	(-0.93)	-0.04	(-0.87)
satisf. with study										
factor 1	0.01	(0.33)	0.01	(0.32)	0.01	(0.33)	0.01	(0.33)	0.01	(0.26)
factor 2	0.06	(1.48)	0.06	(1.48)	0.06	(1.47)	0.06	(1.49)	0.06	(1.51)
factor 3	0.03	(0.77)	0.03	(0.78)	0.03	(0.77)	0.03	(0.78)	0.03	(0.79)
factor 4	-0.05	(-1.15)	-0.05	(-1.15)	-0.05	(-1.15)	-0.05	(-1.16)	-0.05	(-1.15)
work experience during studies										
to make living	0.12	(1.35)	0.12	(1.36)	0.12	(1.35)	0.13	(1.39)	0.12	(1.36)
student assistant	-0.27	(-3.38)	-0.27	(-3.38)	-0.28	(-3.39)	-0.27	(-3.35)	-0.27	(-3.36)
private sector	-0.15	(-1.83)	-0.15	(-1.80)	-0.15	(-1.81)	-0.15	(-1.83)	-0.16	(-1.88)
self-employed	0.04	(0.40)	0.04	(0.40)	0.04	(0.40)	0.04	(0.44)	0.05	(0.47)
not employed	0.02	(0.27)	0.02	(0.25)	0.02	(0.25)	0.02	(0.28)	0.02	(0.28)
percentile of GPA	-0.23	(-1.73)	-0.23	(-1.71)	-0.23	(-1.73)	-0.23	(-1.73)	-0.23	(-1.74)
voc. before uni.	0.06	(0.50)								
voc. overlap			-0.01	(-0.10)						
voc. non-overlap					0.08	(0.65)				
job search: voc. and netw.										
no voc. + no netw.							ref.cat.			
voc. + no netw.							0.03	(0.30)		
no voc. + netw.							-0.10	(-0.35)		
voc. + netw.							0.21	(0.92)		
job search: overlap voc. and netw.										
no overlap+no netw.									ref.cat.	
overlap+no netw.									-0.11	(-0.82)
no overlap+netw.									-0.24	(-1.05)
overlap+netw.									0.61	(2.14)
constant	-1.46	(-5.25)	-1.44	(-5.23)	-1.46	(-5.29)	-1.47	(-5.27)	-1.44	(-5.22)
N	8105		8105		8105		8105		8105	

Source: HIS higher education graduate panels 1999 and 2001; own calculations, not weighted, multiple imputation of missing values.

Table 5.3.11: Original questionnaire in German language: satisfaction with study program and university.

Wie beurteilen Sie die folgenden Aspekte Ihres abgeschlossenen Studiums? (5-Likert-Skala: sehr gut – sehr schlecht)	How would you evaluate the following aspects of your completed studies? (5-likert-scale: very good – very poor)
Strukturiertheit	structuredness
Studierbarkeit (Zeitperspektive)	possibility to complete studies from a timing perspective
zeitliche Koordination	temporal coordination
Zugang zu Praktika/Übungen	access to internships/exercises
Aktualität erlernter Methoden	up-to-dateness of studied methods
Aktualität der Praxisanforderungen	up-to-dateness of practical requirements
Verknüpfung von Theorie und Praxis	conjunction/link of theory and practice
Aufbereitung Pflichtpraktika	rework of mandatory internship
fachliche Vertiefungsmöglichkeiten	possibility to deepen functional knowledge
Einübung wiss. Arbeitsweisen	practice of scientific methods
Einübung mündlicher Präsentationen	practice of presentations
Anfertigen wiss. Texte	scientific writing
Einübung beruflich-professionellen Handelns	practice of occupational and professional action
fach-/berufsbezogene Einübung: Fremdsprachen	job-related practice of foreign languages
Kontakt zu Lehrenden	contact with teaching personal
fachliche Beratung und Betreuung	functional advice and supervision
Besprechung Hausarbeiten etc.	rework of assignments
Verfügbarkeit wichtiger Fachliteratur	access to important literature
Zugang zu EDV-Diensten	access to computing-services
Verwendung EDV in Lehre	use of computerized teaching
ggf. Laborausstattung	laboratory equipment
Unterstützung Stellensuche	supported job search
Angebot berufsorientierender Veranstaltungen	supply of occupation-oriented subjects
individuelle Studien- und Berufsberatung	individual study- and occupational-support

Source: HIS higher education graduate panels 1999 and 2001; own calculations, not weighted, multiple imputation of missing values.

Table 5.3.12: CASMIN educational classification.

CASMIN code	Description
1a	Inadequately completed general education
1b	General elementary education
1c	Basic vocational qualification or general elementary education and vocational qualification
2a	Intermediate vocational qualification or intermediate general qualification and vocational qualification
2b	Intermediate general qualification
2c	Full maturity certificates
3a	Lower tertiary education
3b	Higher tertiary education

Source: Brauns and Steinmann (1999): Educational Reform in France, West-Germany and the United Kingdom: Updating the CASMIN Educational Classification. In: ZUMA-Nachrichten 44, Jg. 23, S. 7–44.

6 INEQUALITY OF OCCUPATIONAL OPPORTUNITIES IN THE LIFE COURSE – A FEW FINAL REMARKS

At the beginning of this volume, I set out to integrate research on educational inequality by social origin with the life course perspective and investigate how educational inequality develops during young adulthood in three different contexts. Two broad research questions defined the framework for my empirical studies:

First, I asked about social inequality in postsecondary educational career patterns with specific attention to the decision to re-enroll. *Second*, I investigated effects of non-traditional educational careers on a successful labor market entry.

Both of these questions were selected with the aim of developing our understanding of the role of later formal education for the intergenerational persistence of social positions via educational attainment. The stimulation of adult formal education by recent institutional developments in the European higher education area moved the German system towards the setting Nordic and Anglo-Saxon countries have experienced for decades. Access to higher education is widened and to a lower degree restricted by the secondary education system. Further, the institutional support and flexibility for adult students is at least announced to be extended. These policies have been implemented explicitly with the aim of creating life chances. As a consequence, they demand a careful examination of changes in life courses. Instead of a historic comparison within one country, I compare the German situation before the Bologna reforms to those contexts which could be seen as something like the blueprint for many recent developments. The changing framework for education in the life course brings up new issues on the patterns of life courses, educational attainment and their dependence on the parental social status. How does social origin relate to educational re-enrollment back from the labor market into

education? And if there are differences, are they context specific, or mainly attributable to the education system alone? How do overall patterns of educational careers change, and does the timing of education constitute a new dimension of social inequality? Do these inequalities have consequences for social status via placement in the labor market? All of these questions seem largely unresolved given the praise sometimes heard on the improvement of life chances via adult education. Sections 1 and 2 prepared the ground for giving an answer to these questions by describing the country specific situations in Germany, the US and Sweden with regard to the institutional setup (section 1) and the individual standardization of education careers (section 2). Section 3 then addressed the question how educational inequality develops into young adulthood, and discussed some potential explanations for country differences.

Furthermore, studying late educational enrollments has more to offer to researchers interested in social inequality than evaluating the macro-structural conditions in a way which is close to policy making. There is a number of questions which is more theoretical nature which contribute to a more general understanding of intergenerational status mobility. By comparison to young children up to secondary school, young adults are supposed to be comparatively independent from their parents. Does social inequality still reach these late transitions? And what could be explanations for such longevity of the effects of parental social positions on educational participation of children? The specificity of the situation makes the research questions I have explicated above to theoretically significant ones. Explanations of social origin differences apply differently than to other thresholds throughout the educational career. A set of theoretical questions therefore can further motivate studying this subject – also with a more detailed view on the micro-level. In section 4 I have addressed several of them:

- How does the development and persistence of young adults own educational expectations relate to social origin (chapter 4.1)?
- Can we test the claim, that parental status is the benchmark for young adults with regard to their own lower limits in terms of status they want to achieve? Is additional formal education a reaction on temporary failure within this aim? Other than for earlier educational transitions, we can directly observe failure in the reproduction of parental status before re-enrollment gets possible (chapter 4.2 and 4.3).

- Do young adults react on life events differently, depending on the costs of education in the context they life (chapter 4.3)?
- Which parent defines the relevant status position? Do mothers become important when the material situation of the family becomes a less direct limitation for higher education (chapter 4.4)?

Answering these questions and developing explanations for these thresholds on the micro-level can not only help to better understand class inequality in general, but also to develop more focused and concrete explanations on the macro-level in the future.

At the same is true for the consequences of non-standard educational careers upon labor market entry. A large and steadily increasing strand of literature within economics and sociology discusses the question why education pays off. Many different explanations were developed, but rarely tested against each other. Differentiation in the pathway through that education is achieved might help in several ways to isolate some of the mechanisms. Section 5 follows the life courses one step further and asks how later education contributes to the so-called OED-triangle (Blau and Duncan, 1967). Two chapters within this section address the issue for the German and the US context respectively. Do non-standard patterns of educational careers lead to consequences on the labor market in a very flexible education system (chapter 5.2 on the US)? And what about the practice of German young adults who qualify for higher education and complete a vocational degree before entering? Does the achievement of this additional (but lower) degree have additional pay-offs to the returns that can be realized from higher education?

Most answers to these questions are discussed in the given chapters and I will not recapitulate them here in detail. There are a small number of somewhat bigger theoretical questions and also some implications for policy that shall be discussed briefly on the following pages.

One such bigger question is how institutional conditions can change life course and life chances. From the results, I suggest that two developments will go along with a flexibilization of the educational career regimes and de-institutionalization of educational career patterns by widening access and promoting

adult studies. We can expect a contribution of open and flexible education systems to a de-standardization of the educational career, but also to a wider de-standardization of life courses throughout young adulthood. If education mixes more with other phases of the life course, e. g. interrupts work careers, is used more often for avoiding unemployment or it interferes with family formation, this has consequences for the typical trajectories of young peoples' biographies. The education system has a direct and powerful impact on the patterns of educational careers, and is thus a strong example for the importance of institutional settings for individual life courses. Previous work on the question which institutional arrangements form patterns of life courses, as discussed in chapter 1, have not taken into account how the higher education system structures postsecondary educational careers. The set of institutions governing the patterns of life courses in youth should be extended by this feature of the higher education system, resulting from its openness towards non-traditional students.

The comparison between Sweden, Germany and the US has proven that these institutions operate comparatively independent from other institutional differences or larger regime types. It therefore supports an approach to comparative research which concentrates on the concrete institutions (Mayer, 2005) rather than on broad (and sometimes vague) regime types (e.g. Esping-Andersen, 1990). By any of the broad classifications known, Sweden and the US would be expected to produce very different outcomes, while a look at the concrete institutional settings correctly suggests that the de-standardization of educational careers is on a similar level. From changes in these settings, we can expect that life courses will change as well – which applies e.g. to the recent reforms put on their way within the German system (see chapter 1.5). Therefore, some policy implications seem appropriate at this stage. The next paragraphs shortly develop an expectation on the development of educational inequality upon flexibilization and de-institutionalization of educational career trajectories.

Equalization by a System of Second Chances – Does it Work?

What consequences can be expected from de-institutionalization of educational careers for intergenerational inequality? Answering this question is not straightforward and needs some interpretation of my and other researcher results. My

conclusion is twofold: on the one side, removing selectivity and improving the opportunities of access for non-traditional students to higher education can create new chances. And even though inequality in later transitions may increase, it may replace the higher inequality that we would have observed if the selection was made earlier. This would be in line with the expectation that later decisions are per se less dependent on the parents due to a generally increasing independence from parents over the life course (Müller and Karle, 1993). When higher education is concerned, the direct dependence on the parents can still be assumed to be high due to continuing financial dependence and the high costs compared to earlier secondary education. For the later enrollment financial independence is often greater than directly after leaving secondary school due to own earnings or spouses resources. In best case, the later chances serve previously disadvantaged individuals to catch up with those who could get more education right after finishing secondary school. Then, lower social origin students would likely be over-represented among re-enrollers. That this is in most cases not true has been shown by several chapters of this volume, especially chapters 3.2 and 3.3. For a reducing of removing inequality, this is not even necessary. If a system replaces earlier transitions by later transitions, social inequality will already be smaller if inequality in later transitions is smaller than in earlier ones. Thus, my findings do not contradict the claim that more equality of educational opportunities could be achieved by opening access and offering support for non-traditional students who did not qualify for higher education via specified tracks in the secondary education system. The idea that a general shift into later transitions could reduce inequality even supported by several findings, e.g. the very high inequality in earlier transitions in Germany by comparison to the somewhat higher inequality in Sweden and the US in later transitions.

However, a number of mechanisms possibly counteract this equalization, at least to some degree. First and foremost, it should be mentioned that late chances could in most cases not be used by lower class children who were diverted away from higher education earlier. More often, upper class children made use of these opportunities and thus inequality in educational attainment increased over the life course. The only exception throughout all empirical analyses within this book – and also throughout all literature that is known to me – are women in the US. Among them, re-enrollments after a longer time out of education – at least two years – working class daughters are more likely to enroll and this might indeed help them to

catch up to small degree in their educational attainment. For all other cases, those who have better chances of educational achievement are also more likely to participate in later postsecondary education. Thus, Merton's Matthew-effect in science (Merton, 1968) seems to apply on the process of educational attainment too: higher initial chances are linked with a permanent advantage. The finding is refined when controlling for different measures of scholastic performance in the earlier educational career. For the open and flexible contexts Sweden and the US, these are able to account for much of the class differences in re-enrollment activities. This finding has interesting implications for the education system: it means that earlier disadvantages are the source of later disadvantages, rather than the question of later inequality (in re-enrollment) itself. Hence, widening access to late transitions might improve the chances of lower class children somewhat by the removal of nominal barriers which were build up earlier in the educational career. But it will not remove the substantive barriers of a lack in schooling and development. This interpretation is in line with a conclusion that Cameron and Heckmann draw upon their study about the GED-degree in the US: 'there is no cheap substitute for schooling' (Cameron and Heckman, 1993, p. 1). Non-equivalence of preparedness for higher education explained much, but not all of the inequality in late school entry. For the potential of policies promoting late second chances, this suggests that these policies might work to some degree and could potentially indeed help some of the lower origin students – but only if their chances for better achievement in earlier schooling would be improved. Then, however, one might wonder if they would even need second chances, since the counterfactual situation could be that lower class students enroll directly just as their upper class peers when prepared equally well. In sum, these findings can strengthen the suggestion to intervene earlier. But then the question remains what we can expect if only the postsecondary education system would change, and the secondary education system remained as it is.

What could be shown in section 2 is that in education systems with open success, educational career patterns de-standardize over individuals. Chapter 3.4 showed that lower class individuals are the once who are most affected by this de-standardization. This new line of inequality must be questioned with regard to two different issues before concluding about its problematic nature which might go along with flexible systems.

First, it is not sure what the counterfactual situation is: will more young adults from the lower classes delay postsecondary education when possibilities for later re-enrollment are given and attractive? Does this lead to a delay of educational careers for some individuals, and a 'cooling out' or diversion away from the education system for others? Or are the many non-standard educational careers a result of the usage of second chances of individuals who would have been unable to study otherwise? Chapter 3.4 showed that lower classes delay more often, even though their re-enrollment rate is lower, as shown in 3.2. From such a pattern, one can infer that the non-standard patterns do at least not stem from later equalization through second chances. Thus, at least a part of the non-standard patterns is likely to be attributable to intended delays of higher education, instead as to ad hoc chances of preferences towards higher education. An open and flexible system, as the US or Sweden, invite to delay and it is therefore likely that additional inequalities in timing are provoked compared to more rigid systems. In chapter 4.1 I have followed on this question by analyzing a dataset which includes information about the sequential order of educational decision making in the German context. With regard to the most frequent detour for this context, the completion of both a vocational and a higher education degree, I showed that a part of the young adults planned this pattern from the beginning, while about half of them also re-enroll ad-hoc. There is some cooling out among those who delay their entry into higher education, which also causes a small increase in the overall inequality of higher education participation. Taking these findings together, one should expect that at least a part of the potential students delay their higher education enrollment when the education system invites them to do so.

Second, one may wonder whether there are any negative consequences related with non-standardized educational careers – with regard to success within the education system as well as upon labor market entry. In this volume, I have not investigated the consequences within the education system but in section 5, I discussed literature which presents clear-cut answers to this question in places. All studies I have found and discussed show higher drop-out rates among those who enter late or interrupted before. On this issue, certainly more research is needed about the specific circumstances that cause drop-outs among re-entrants into education. Many different answers are possible, such as life events in other biographical areas – of which family formation is just one example. The consequences upon labor market entry are discussed within section 5 at length. Overall, besides obvious opportunity

costs for a later realization of returns to education in the labor market, both studies on the US and on Germany reveal that there are on average no strong negative consequences for later achievement. It is, however, important to note that this is only the case if the same amount of education is eventually achieved, and the higher drop-out rates must be kept in mind. This pattern, with strong consequences within the educational system but at most small consequences within the labor market, has a clear policy implication. Delays and non-standard educational careers are overall unproblematic (in the cases we know) with regard to labor market outcomes, including non-monetary returns. However, non-traditional students often lag behind the direct entrants in their educational achievement. Thus, flexibilization and openness of the education system should be accompanied by an improvement of chances to succeed within the education system for adults with labor market experience. There is not much research with regard to the reasons for their apparently problematic situation. Future research should for example investigate whether it is more important to offer childcare since family formation breaks out adult learners, or whether preparedness for higher education by the secondary school system is insufficient for those who typically delay.

In sum, there could be some equalization in educational attainment through a more open education system to non-traditional learners, but it is unlikely that the great expectations of a society of equal opportunities through lifelong learning will come true. Benefits are expected to be on a lower level, and go along with new issues of inequality that have to be counted in. A new differentiation in educational career patterns will develop, which may imply a new dimension of educational inequality in particular with regard to persistence in the education system. The re-enrollment decision will become a more important educational threshold and reducing inequality in re-enrollment will become a new task, which is not done by just offering admission. And most importantly, some of the social inequalities developed in earlier stages of the educational career will re-appear and manifest themselves in this later threshold.

Inequality in Late Educational Transitions and Educational Career Patterns

Beyond the question how systems which shift educational transitions into later stages of the life course perform overall with regard to inequality of opportunities, the existence of inequality in late educational transitions has policy implications in its own right. The existence of class differences way beyond the typical age of moving away from parents home first illustrates the strength of parental influence. The constant inequality requests a closer look at its reasons. Some of those explanations which I have investigated in this volume do have policy relevance in their own right.

First and most directly, the costs for higher education could be a continuing deterrent for lower class young adults to enter the educational system, even after a number of years in the labor force. This could easily be tackled by policies reducing the costs for higher education and offering studentships targeted at older students. Overall, I do not think that this explanation is a very likely one, since the control of poverty does not change the continuing effects for the US much. And I also observe substantial inequality in Sweden, where costs have already been reduced by such policies. Tackling the problem of direct costs might therefore be seen as a helpful step, but it is probably not sufficient for equalizing re-enrollment.

Second, I have paid specific attention to the motive of relative status reproduction, since status demolition can be directly observed when studying re-enrollments. Assuming that families give first priority to reproduction of parental status within the next generation leads to the expectation that those who failed in their aim would re-enroll to have better chances of overcoming this situation. Then, later chances of re-enrollment would first and foremost cater the needs of 'disappointed' or 'downgraded' upper class children. The evidence for this explanation is not very strong from my findings and neither from previous work done by other others. Nevertheless, there is some support for this explanation. Balancing this motive is hard to achieve by policies. The fact that it does not explain much is therefore – at least from a policy perspective – a finding that should be welcomed.

Third, the 'primary effects', differences in education performance and attendance in secondary school, are found to be important explanatory variables. This suggests that not even so much the postsecondary education system itself should be made more attractive for lower class children, but secondary school has to prepare more equally for higher education. As discussed above on the system level, nominally

equivalent access will not suffice for achieving this aim. Programs for secondary school students who are falling behind are likely to be more effective.

Fourth, most specific to the late educational participation are life events in other biographical areas that may interfere with late educational participation. These events are shown to be correlated with origin at least to some degree, as discussed in chapters 4.4 and 4.5. Furthermore, they are related with other lines of inequality, in particular sex-segregation. For women it is much more likely that family formation conflicts with their work career, but also with education. Therefore, fostering entry into education throughout adulthood should take into account the specific situation of adult learners, in particular with regard to their family situation. In this context it is interesting that women re-enroll more often after a divorce. This suggests paying attention not only to childbearing, but also to partnership formation. These women might have to re-train after staying at home for a long time, which puts policies into question that discourage women's labor force participation.

My last conclusion refers to the relevance of the promotion of lifelong learning for sociologists. The changing nature of study behavior and timing of education, student body and access situation into the education system increases the relevance of seeing inequality in postsecondary education from a life course perspective. In the US, this circumstance has led to a large body of research, as my literature review in several places of the book shows (in particular in sections 2 and 3). For Germany, education throughout the life course will become of greater relevance for social scientists. The developments under recent reforms are likely to change the interplay of postsecondary education and other life course domains and thus lead to more complex situations for studying inequality in this area of education.

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